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# PERTINACITY AND CHANGE IN MAPUDUNGUN STRESS ASSIGNMENT

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## Abstract

The stress assignment system of contemporary Mapudungun (a.k.a. Araucanian) has long been controversial. This paper reconsiders the system in the light of morphological structure, contrasting the present-day data with the sparse but suggestive historical record spanning 1606–1916. I argue that Mapudungun has undergone changes both to the metrical and morphological domains determining stress position. I show that early lack of weight-sensitivity is quickly replaced by a decidedly weight-sensitive system and that stress appears to have changed from marking the edge of verbal roots, to marking the edge of stems. Crucially, however, certain aspects of the system—such as right-alignment of prosodic units and the left-headedness of feet—show pertinacity: lack of change despite surface alternations. I conclude that stress assignment in Mapudungun is subordinate to morpho-phonological transparency both synchronically and diachronically, such that the hierarchy and position of stress may vary in order to highlight elements of the language’s polysynthetic, agglutinating morphology.

## 1 Introduction

Mapudungun (ISO 639-3), the ancestral language of the Mapuche people of south-central Chile and Argentina, has a recorded history of just over four centuries.<sup>1</sup> As with most languages of the Americas, however, the diachrony of

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<sup>1</sup>I would like to thank the editors and two anonymous reviewers at IJAL for their encouraging and perceptive suggestions. These have doubtless improved the form and content of the

Mapudungun remains largely unexplored. I will argue here that, while the record is somewhat patchy and often difficult to interpret, early Mapudungun data can be successfully mined for at least some features and synchronic stages, allowing us to propose paths of development into the surviving varieties.

This paper focuses on stress, for which Present-Day Mapudungun (PDM) has attracted considerable attention in the typological literature. Indeed virtually all major surveys of stress assignment include “Araucanian”<sup>2</sup> — the now-dispreferred exonym for Mapudungun — as a potential example of a “perfect grid” system, where, from left to right, all even-numbered syllables bear stress, independent of syllable weight (see 1, where main stress is on the second syllable, followed by secondary stress on the fourth and sixth syllables, if available).<sup>3</sup>

(1) “Perfect grid” stress in PDM (Echeverría & Contreras 1965: 134)

- a. [wu.'le]  
‘tomorrow’
- b. [tri.'pan.to]  
‘year’

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paper. I am also indebted to Patrick Honeybone and Aditi Lahiri for comments on earlier versions of the text. Finally, I owe an enormous debt of gratitude to the native-speaker informants of the Rucapangue and Rupahue communities near Cholchol, Chile, especially Mr. Sergio Catricura, my main informant. Any remaining errors of fact or interpretation are none but my own.

<sup>2</sup>Araucanian — Spanish *araucano* — is a term imposed by the *conquistadores* for both the people and their language. It probably originates from the demonym for *Arauco*, a place name based on Mapudungun [rau ko] ‘muddy water’. Today, the endonyms *Mapuche* ([mapu-tʃe] ‘land-people’), for the people, and *Mapudungun* ([mapu-θuŋun] ‘land-speech’), for the language, are preferred.

Among others, Araucanian is discussed by Hyman 1977: 41-2, Kager 1993: 409, 2007: 205-6, Hung 1993: 177-80, 1994, Kenstowicz 1994: 556, Hayes 1995: 266, Gordon 2002: 522, 2011: 143 Hyde 2002, 2011: 1055-65, McGarrity 2003: 59-61, Tesar 2004: 220-21, Hermans 2011: 982-984, Goedemans, Heinz & van der Hulst 2014, Martínez-Paricio & Kager 2015.

<sup>3</sup>The following glossing conventions are used in this paper (Zúñiga 2006b, Smeets 2008): APPL: applicative, BI: broken implicature (see Soto & Hasler 2010), CAUSE: causative, CIS: cislocative, CONT: continuative, D: dual, DES: desiderative, DET: determiner, EP: epenthetic, FP: focal person, FUT: future, HAB: habitual, IND: indicative, INV: inverse, IMP: imperative, NEG: negative, NMLS: nominaliser, PASS: passive, PL: plural, PROG: progressive, POST: postposition, REST: restorative, RFX: reflexive, SIM: simulative, SP: satellite person, SG: singular, SUBJ: subjunctive, TEMP: temporal, TRLOC: translocative, 1: first person, 2: second person, 3: third person. Additional abbreviations include D: dependant, H: heavy syllable / head, L: light syllable, PDM: Present-Day Mapudungun, R: root, s: stem, σ: any syllable, ω: prosodic word, full stop (period) in the parsing line: syllable boundary.

- c. [e.'lu.-mu.-j-u]  
give-2INV-1IND-D  
'you give us (both)'
- d. [e.'lu.-a.-e.-n-ew]  
give-FUT-INV-1SP-3  
's/he will give me x'
- e. [ki.'mu.-fa.,lu.-wu.-la-j]  
know-SIM-RFX-NEG-3IND  
's/he (her/himself) pretended not to know'

Regardless of whether systems like these exist in the languages of the world, the data upon which such claims are made for Mapudungun are problematic. First of all, the first-hand description which the typologists rely on — Echeverría & Contreras (1965) — has recently been shown to be empirically lacking, both in the quality and quantity of data (de Lacy 2014). Furthermore, Echeverría and Contreras' account is at odds with all other available descriptions of PDM stress (cf. Echeverría 1964, Salas 1976, 1992, Catrileo 1995, Zúñiga 2006b, Smeets 2008, Sadowsky, Painequeo, et al. 2013, Molineaux 2014), which tend to place main stress on the word's final syllable, if closed or, alternatively, on the penult. Finally, the typological analyses fail to consider the internal structure of the target words, presupposing a single level for stress assignment, despite evidence that morphology is key to the language's prosodic organisation (cf. Augusta 1903, Echeverría 1964, Molineaux 2014, 2016a).

In what follows, I will argue that morphological boundaries and hierarchies play an important part in the stress-assignment system of Mapudungun past and present (after Molineaux 2014), and that disagreement in the basic descriptions of PDM can be attributed — at least partly — to failure to consider the interaction of these two levels of linguistic structure. I provide a summary of the morphologically-based account of PDM stress assignment given in Molineaux 2014, which is both trochaic and quantity sensitive in nature (*contra* Echeverría & Contreras 1965 and the typological literature).

The bulk of the article goes on to propose a careful re-reading of the historical sources for stress in Mapudungun, applying the insights gained in the study of PDM to understanding its past. Based on over four centuries of materials, I reconstruct the stress-system for the language at four distinct synchronic stages (Section 3), tracing a plausible path between them (Section 4).

The key finding is that Mapudungun stress has undergone important surface changes which, nonetheless, have conspired to highlight the morphological

structure of words. Hence, we observe that stress has changed in terms of quantity sensitivity and the marking of stems, while it has remained right-aligned and left-headed in its foot-structure. It is this pattern of *pertinacity* (Dresher & Lahiri 2003, Lahiri 2015) — the preservation of certain elements of the grammar despite extensive restructuring elsewhere — that shows the history of Mapudungun to be fundamentally distinct from other, better-documented stress systems.

## 2 Present-Day Mapudungun and the literature on stress

Today, Mapudungun is spoken by an estimated 144,000 people in Chile (Zúñiga 2007) and 8,400 in Argentina (INEC 2005). In both countries, however, monolingualism is now exceedingly rare, and transmission is in sharp decline (Gundermann et al. 2008, Zúñiga 2007). Central Mapudungun, spoken in Chile’s Araucanía and Los Ríos regions, is the most robustly preserved variety, and the basis for most contemporary descriptions (including my own, which I report on below). Huilliche, the southernmost variety, is considered the furthest dialectal outlier (cf. Alvarez-Santullano Busch 1992, Sadowsky, Aninao, et al. 2015), while Northern Mapudungun, spoken in the Bío Bío Region of Chile, differs only moderately from the central variety (see Salas 2006, Lenz 1895–1897, Croese 1980, 1985). Varieties in Argentina’s Neuquén and Río Negro regions are generally similar to Central Mapudungun, while those spoken in La Pampa seem closer to Chile’s northern varieties (Golluscio 2009). In terms of stress, however, there are no reported dialectal differences.

Primary accounts of Mapudungun prosody are fundamentally descriptive, providing no formal analysis for stress placement. All such accounts agree on the non-contrastive nature of stress. They also identify a certain perceptual weakness to stress cuing, alongside a tendency for stress to shift position in particular domains. Crucially, there are no clear phonological patterns conditioned by stress. Potential candidates, such as vowel neutralisation or deletion in unstressed syllables, have been shown either to have no empirical basis (Sadowsky, Painequeo, et al. 2013: 93–94) or to have alternative, more parsimonious analyses (Molineaux 2014: 35–38).

There are only minor discrepancies regarding stress-placement in most primary literature on PDM (for details see Molineaux 2014). Overwhelmingly, these sources suggest a trochaic parsing for the language (cf. Suárez 1959, Echeverría 1964, Salas 2006, Zúñiga 2006b, Sadowsky, Painequeo, et al. 2013, Molineaux 2014). Based on Echeverría & Contreras (1965), however, typological studies

take Mapudungun to be fundamentally iambic. The resulting two accounts, as presented in Table 1, differ in all basic parameters for stress assignment.

	FOOT	WEIGHT	DIRECTION	ITERATION
PDM SPECIALISTS	Trochaic	Sensitive	Right-Left	No
TYPOLOGISTS	Iambic	Insensitive	Left-Right	Yes

Table 1: Two competing accounts of stress placement in Mapudungun

As bizarre as this misalignment may seem, it is my claim that the main differences in these analyses can be explained by taking into account the brevity of most simplex words, and the morphological boundaries of the more complex ones. The result is a tendency for both analyses to converge, especially where overridden by morphological rules.

I will show that, while morphological structure plays a non-trivial role in Mapudungun prosody, the baseline for phonological stress assignment can be established by examining nouns. This is because nouns rarely present complex morphology, and so need not correspond to more than a single layer for stress assignment.

The data for my analysis of PDM comes from a series of interviews and guided elicitation tasks conducted with eight Mapudungun-dominant bilinguals living in the vicinity of Cholchol, in Chile’s Araucanía Region (for details see Molineaux 2014, 2017). Crucially, speakers show reliable intuitions regarding the position of stress in words in isolation. This ease of intuition is probably facilitated by awareness of stress in Spanish, which plays an important role in both the morphology and orthography of the language. While these percepts were elicited for words in isolation, the main acoustic correlate of stress (pitch maxima) could be found consistently on the same syllable for the same lexical items across different positions in the utterance, thus revealing these to be a lexically-based prominences and not a only a phrasal ones (Molineaux 2014: 103–9).

## 2.1 Morphologically simplex nouns

A representative sample of di- and trisyllables and their relevant stress patterns are presented in Table 2. Here I follow the syllabification practices in Echeverría (1964), Salas (1976, 2006) and Zúñiga (2006b) which claim surface onset and coda clusters are avoided, while onsets are maximised.

Leaving aside the data on disyllables ending in a vowel (Table 2 c–d), this first approximation points strongly to a weight-sensitive system, or more specifically

Disyllables			Trisyllables		
a.	[pu.'kem]	'winter'	e.	[a.t̪a.'waɬ]	'hen'
b.	[ɭaf.'keŋ]	'sea'	f.	[a.t̪uɬ.'peŋ]	'floating ash'
c.	[ma.pu]~[ma.'pu]	'land'	g.	[ma.'wi.θa]	'woodland'
d.	[piw.ke]~[piw.'ke]	'heart'	h.	[pɯŋ.'pu.ja]	'armpit'
			i.	[pi.'fiɬ.ka]	'two-tone flute'

Table 2: Stress-placement in PDM monomorphemic nouns

to a right-aligned moraic trochee as the basic foot structure of Mapudungun nouns.<sup>4</sup> Final closed syllables are uniformly stressed (Table 2a–b and e–f), as they are parsed as final heavy feet (cf. [a.t̪uɬ.('peŋ)]). Where there is no final closed syllable, the penult (Table 2g–i) bears stress, either with a branching foot made up of two light syllables (cf. [pɯŋ.('pu.ja)]), or as a heavy syllable followed by an unfooted light (cf. [pi.('fiɬ).ka]). For simplex nouns, then, this analysis is more parsimonious than the left-aligned quantity insensitive iambic analysis of many typological accounts, which predicts second-syllable stress. Indeed, trisyllables ending in a closed syllable (2e–f) present a challenge to the iambic analysis, even if they are a relatively infrequent type of monomorphemic word.

The vowel-final disyllables exemplified in Table 2 c–d alternate the position of stress, such that it fits the quantity insensitive iambic analysis when final, and the quantity sensitive trochaic one when initial. This pattern is identified by virtually all present-day accounts, with the general consensus that stress falls on the penult more frequently than on the final. It is also reported that penultimate stress is judged by speakers as “more correct” than the alternative, and may thus be register-bound. Furthermore, the placement of stress seems not to be governed by the word’s position in the phrase or utterance, but fluctuates relatively freely (Molineaux 2014, 2017). Finally, this fluctuation in nouns is not attested for adjectives, adverbs or pronouns, which have final stress irrespective of the final syllable’s weight (cf. [e.'ɲum] ‘hot’, [we.'θa] ‘bad’, [wu.'le] ‘tomorrow’, [iɲ.t̪je] ‘I/me’).

<sup>4</sup>Following Hayes (1995): a moraic trochee has the structures (L L), (H) and sometimes (L), where underlining represents the position of stress, while quantity-insensitive iambs may be represented as ( $\sigma$   $\sigma$ ). This second foot type, however, is explicitly banned in the Hayesian model (Hayes interprets Mapudungun as a defective quantity sensitive iambic system, where weight-by-position plays no role — 1995: 266–268).

## 2.2 Multi-suffix verbs

While speakers I interviewed had intuitions for no more than one stress in monomorphemic words, complex words were often deemed to have two stresses. This lines up with the observations made by several Mapudungun grammarians, who claim that for “longer words” there are two stress windows, one at the right edge, and one at the left (Salas 2006: 74, Zúñiga 2006b: 64, Smeets 2008: 49). While they agree on the pattern of right-edge stress — final if the syllable is closed, otherwise penultimate — the position of left-edge stress is less clearly defined, falling on either the first or the second syllable. Some representative examples for multi-suffix verbs — with native speaker intuitions marked — are given in (2). Note that in my data subjects tend not to discern a hierarchical organisation of the two stresses (Molineaux 2014, 2016a).

- (2) a.  $[[\theta ew. 'ma.]_R - ka. - 'ki - j]_\omega$   
 make-CONT-HAB-3SG:IND  
 ‘s/he is usually making’
- b.  $[[i. 'ʃif.]_R - tu. - pu. - ke. - 'la - j. - m - i]_\omega$   
 throw-REST-TRLOC-HAB-NEG-IND-2-SG  
 ‘you don’t usually throw x back here’
- c.  $[[ 'lef.]_R - pu. - 'le - j]_\omega$   
 run-TRLOC-PROG-3SG:IND  
 ‘s/he is running here’
- d.  $[[ʃi. 'pa.]_R - ke. - 'la - j. - m - i]_\omega$   
 exit-HAB-NEG-IND-2-SG  
 ‘you don’t usually go out’

A quick look at the examples in (2) shows right-edge stress is consistently on the final pre-consonantal vowel, in the general weight-sensitive, trochaic pattern identified for nouns. In the case of the left-edge, the pattern would be difficult to ascertain, were it not for the indication of the verbal root in brackets. Consistently, it is the final syllable of the root that takes stress, irrespective of weight considerations. As verbal roots tend to be disyllabic, with occasional monosyllables (cf. 2c), it is unsurprising that Echeverría & Contreras (1965) describe a quantity-insensitive iambic system at the left edge, a pattern that also aligns with adjectives, adverbs and pronouns.

There are still a couple of important wrinkles in this description of verbs. Firstly, there is a small category of fairly productive diathesis-changing suffixes



which tend to bear stress (cf. underlined suffixes in 3). Due to their core semantics, their immediate adjacency to the root, and their ability to induce root-allomorphy (cf. Molineaux 2014: 161-2), these suffixes may be treated, together with the verbal root, as an extended verbal stem. This, in turn, may be the broadest domain for the realisation of left-edge stress, which we now more properly term *stem stress* and analyse as right-aligned to the stem edge. Note, then that in the examples in (3) there is stress both on a word-final trochee and on the final vowel of the stem.

- (3) a. [[tu.ku.]<sub>R</sub>-'ŋe.]<sub>S</sub>-la-'fu-j]<sub>ω</sub>  
 place-PASS-NEG-BI-3SG:IND  
 's/he (it) didn't used to be placed'
- b. [[la.ŋ]<sub>R</sub>-'im.]<sub>S</sub>-ke-'fi-j]<sub>ω</sub>  
 die-CAUSE-HAB-DIR:3SP-3SG:IND  
 's/he usually killed him/her'
- c. [[[pe]<sub>R</sub>-p.'ma.]<sub>S</sub>-la-'fi-j]<sub>ω</sub>  
 see-APPL-NEG-DIR:3SP-3SG:IND  
 's/he did not see him/her/it (for the benefit/detriment of someone)'

The second issue to account for in the verb-stress data is that of clash arising from the adjacency of stem and right-edge stress domains. Although occasionally clash is tolerated, the default pattern in clash contexts — as seen in the examples in (4) — seems to be the deletion of stress on simple stems (stem=root) and the preservation of stress in complex stems (stem= root+suffix). The result is the stressing of the word-final trochee in (4a-b), and the stressing of the diathesis-changing suffix in (4c-d)

- (4) a. [[le.li.]<sub>S</sub>-'fi-j.-m-i]<sub>ω</sub>  
 watch-3SP-IND-2-SG  
 'you watch him/her/it'
- b. [[e.li.]<sub>S</sub>-'fi.-j]<sub>ω</sub>  
 watch-3:SP-3SG:IND  
 's/he watches him/her/it'
- c. [[[e.lu-p.'ma.]<sub>S</sub>-'fi-j.-m-i]<sub>ω</sub>  
 give-APPL-3SP-IND-2-SG  
 'you give him/her/it x'

- d. [[[[a.ŋ]–'im.]<sub>S</sub>–fi–j]<sub>ω</sub>  
 die–CAUSE–3SP–3SG:IND  
 ‘s/he kills him/her/it’

Although there may be a number of ways of establishing the basic prosodic units and processes leading to stress positioning in PDM verbs (see, for instance, the proposals in Molineaux 2014), it is clear that there is a place for the moraic trochee in the system, as well as for morphological structure playing a fundamental role. As we shall see in the following section, these traits are not limited to the verbal system.

### 2.3 Nominal compounds

In contrast to the richness of Mapudungun verbal morphology, nouns show practically no inflectional or derivational affixes. Nevertheless, the concatenation of free nominal stems — compounding — is highly productive. A peculiarity of this word-building process in the language is that it displays compounds with both an initial and a final morphosyntactic head (cf. Baker & Fasola 2009: 598).

- (5) a. [tʃa.'fo]<sub>D</sub>–[ku.'ʃan]<sub>H</sub>  
 cough–disease  
 ‘a cold’  
 b. [tʃa.'ŋuʌ]<sub>H</sub>–[ŋa.'mun]<sub>D</sub>  
 finger–foot  
 ‘toe’  
 c. [ku.θi]<sub>D</sub>–['fo.ro]<sub>H</sub>  
 mortar–bone  
 ‘spine’  
 d. [fo.'ro]<sub>H</sub>–[ʃaʌ.wa]<sub>D</sub>  
 bone–fish  
 ‘fishbone’

Note that in the examples in (5a,b) the stress system seems to follow what we find in the verbal system: stress falls on the final closed syllable of the word (a right aligned moraic trochee), as well as on the final syllable of the first root-element, irrespective of weight. There are also cases where this pattern would predict stresses clash, as in (5c,d), where the target syllables of the two rules

are adjacent. Such compounds reveal a new pattern in the data: the head of the compound preserves stress, while the morphologically dependant root lacks stress altogether, hence (5c) has no stress on the first element, and (5d) has no stress on the second.

## 2.4 Obligatory Finite Inflection (OFI) and stress

Given that in the following sections we will be examining stress in early descriptions of Mapudungun, and that such works are particularly concerned with the intricacies of verbal inflection, I introduce here the most commonly discussed inflectional paradigms in the language, termed “obligatory finite inflection” (Salas 1992). The OFI is usually made up of the three rightmost slots in the language’s complex agglutinating verbal morphology, marking mood, person, and number,<sup>5</sup> all of which are obligatory for finite verbs, as in (6). This position is particularly relevant for our purposes, as the structure of rightmost morphemes will determine right-edge stress placement.

	ROOT	MOOD	PERSON	NUMBER
(6)	ʃipa	-l	-m	-u
	exit	-SUBJ	-2	-D
	‘if you two exited...’			

Considering the mostly agglutinating nature of the language, portmanteau morphemes are thought to be the exception (cf. Rivano 1989: 150). However, the first person singular indicative /-(i)n/ and the singular forms of the imperative, /-tʃi/, /-ŋe/, and /-pe/ (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> person, respectively) seem to be undecomposable. Excluding these morphemes, it is easy to assume that distinct meanings in the paradigms of verbs should be represented by separate affixes at the underlying level — which is precisely what most accounts do. The language also appears to have little in the way of suppletive inflection, but does display some regular phonological alternations that may somewhat obscure the agglutinating pattern. The overall one-affix, one-meaning system for mood, person and number can be summarised as follows, according to Salas (1992), Zúñiga (2006b) and Molineaux (2014):

A range of alternations in the syllabic makeup of PDM verbs, which affect stress placement, are produced by (a) the alternation between syllabic and non-syllabic high-front sonorants ([i~j]) marking the indicative, first person or

<sup>5</sup>Mapudungun has a direct/inverse person marking system in which the transitive verb is marked to indicate which of the two arguments is more central/salient to discourse. In direct (zero-marked) verbs, it is the A and in inverse-marked verbs it is the P argument. (cf. Salas 1976, 2006, Baker 2003).

	IND	SUBJ	IMP
Mood	-i	-(i)	-∅
	1	2	3
Person	-i	-m	-∅
	sg	D	pl
Number	-i	-u	-n

Table 3: Mood, person and number markers in Mapudungun

singular), (b) the deletion and (c) insertion of these same segments, and (d) the insertion of epenthetic [i] to break up consonantal clusters. A cursory statement of the key patterns at play in the inflectional system is given in (7),<sup>6</sup> while tables 4 and 5, based on Salas (1991, 1992), Zúñiga (2006b), and Molineaux (2014), make the surface alternations plain.

(7) Key phonological processes governing the OFI in PDM

- a. Glide formation: /i/ becomes [j] following a vowel, except where it would create a word-final final cluster. (e.g. /kon-i-i-u/ → [ko.ni.ju], but /ʃipa-∅-i-n/ → [ʃi.pa.iɲ] - \* [ʃi.pajɲ])
- b. High-front sonorant deletion: /j/ is deleted in tautosyllabic series with /i/, except when final (e.g. /ʃi.pa.-i-i-n/ → [ʃi.pa.iɲ]; /ko.n-i-i/ → [ko.nij])
- c. High-front sonorant insertion: /j/ is inserted as a transition between high vowels (e.g. /ʃi.pa.-l-i.-u/ → [ʃi.pa.li.ju])
- d. Epenthesis: [i]-inserted to break up tautosyllabic consonantal series (e.g. /kon-∅-m-n/ → [kon.miɲ])
- e. n-palatalisation: /n/ becomes [ɲ] following a high front vowel (e.g. /kon-∅-i-n/ → [ko.niɲ])

An important analytical difference must be made between [i] in the final syllable of all forms of the second person plural and [i] in the vowel-initial allomorphs of the subjunctive marker /-il/ and the indicative 1<sup>st</sup> singular marker /-in/ (see Table 5).<sup>7</sup> In the first case, the vowel is never stressed, and in the second cases, it usually is. As epenthetic [i] is well attested elsewhere in Mapudungun,

<sup>6</sup>See Rivano (1990) and Molineaux (2014) for formal treatments of these patterns.

<sup>7</sup>The vowel-initial allomorph appears to be selected in inter-consonantal position, and in word-final position following a consonant (i.e., where /-l/ would create a consonant cluster).

		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	SG	[ʃsi.'pa-n]	[ʃsi.'pa-j.mi]	[ʃsi.'pa-j]
	D	[ʃsi.'pa.-ju]	[ʃsi.'pa-j.mu]	"
	PL	[ʃsi.pa.-'iɲ]	[ʃsi.'pa-j.mɪn]	"
SUBJ	SG	[ʃsi.'pa.-li]	[ʃsi.'pa-l.mi]	[ʃsi.'pa.-le]
	D	[ʃsi.pa.-'li.ju]	[ʃsi.'pa-l.mu]	"
	PL	[ʃsi.pa.-'liɲ]	[ʃsi.'pa-l.mɪn]	"
IMP	SG	[ʃsi.'pa.-tʃi]	[ʃsi.'pa.-ɲe]	[ʃsi.'pa.-pe]
	D	[ʃsi.'pa.-ju]	[ʃsi.'pa.-mu]	"
	PL	[ʃsi.pa.-'iɲ]	[ʃsi.'pa.-mɪn]	"

Table 4: PDM verbal paradigm for the vowel-final root [ʃsipɑ-] ‘exit’

		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	SG	[ko.'n-ɪn]	[ko.'n-i.mi]	[ko.'n-ij]
	D	[ko.'n-i.ju]	[ko.'n-i.mu]	"
	PL	[ko.'n-iɲ]	[ko.'n-i.mɪn]	"
SUBJ	SG	['kon.-li]	[ko.'n-ɪl.mi]	['kon.-le]
	D	[kon.-'li.ju]	[ko.'n-ɪl.mu]	"
	PL	[kon.-'liɲ]	[ko.'n-ɪl.mɪn]	"
IMP	SG	['kon.-tʃi]	['kon.-ɲe]	['kon.-pe]
	D	['kon.-ju]	['kon.-mu]	"
	PL	[kon.-'iɲ]	['kon.-mɪn]	"

Table 5: PDM verbal paradigm for the consonant-final root [kon-] ‘enter’

I assume that the unstressed forms are, indeed, epenthetic vowels added after stress assignment, while stressed [ɪ] is part of the underlying allomorph of the relevant suffixes (see Section 4.3).<sup>8</sup>

Most importantly we note that, given the caveats above, minimal inflectional patterns in PDM follow the general stress pattern established for multi-suffix verbs. As a right-aligned trochee would either overlap or clash with stem-final stress in OFI-only verbs, only the trochaic pattern is consistently visible.

<sup>8</sup>In general, contemporary and historical grammars and texts use [ɪ] and [ə] somewhat interchangeably, both for what appear to be epenthetic vowels and underlying ones. Although statements are found in the literature placing [ə] in unstressed positions, and [ɪ] elsewhere, transcriptions are not consistent. Indeed, in a careful phonetic study, Sadowsky, Painequeo, et al. (2013: 93) actually find the opposite distribution.

Note that, while in vowel-final roots, most forms of the verb display an overlap between the two potential locations for stress, in consonant-final ones, stress is more often assigned to a vowel belonging to the inflectional material, rather than the root.

## 2.5 Summary for stress in PDM

As we have seen, then, the stress pattern for PDM nouns and verbs is predominantly a right aligned moraic trochee. In the case of adjectives, adverbs and pronouns, however, stress surfaces as final. We have also encountered this latter pattern in the first element of morphologically complex verbs and nouns. Although here I remain agnostic as to the latter pattern’s foot structure, one possible analysis is presented in Molineaux (2014). There, I propose moraic trochees for both the word and the stem edge, with a constraint against stressing an initial syllable (initial syllable extrametricality) guaranteeing stem final stress in most forms.<sup>9</sup> An alternative interpretation of the facts, as suggested by a reviewer, would be for PDM to have a ‘non-cohering’ metrical system (such those proposed for some Panoan languages by González 2016) where the word-level right-aligned moraic trochee of nouns and verbs stands alongside a right-aligned iambic foot in stems, adjectives, adverbs and pronouns.

Perhaps most interestingly, the PDM stress system — particularly in compounds and verbs — seems to establish a hierarchy of stress-placement that makes reference to several levels of morphological structure. Even though it has been mentioned that stress is perceptually ‘weak’, and that it has little interaction with the phonological system overall, we can also see (as claimed in Molineaux 2014, 2016a) that it plays an important role in highlighting — demarcating — the morphological structure of this highly agglutinating language.

Lack of agreement in previous work on the language, in my view, is unsurprising, as the ultimate system for stress assignment is not only layered, but also allows for a fair amount of variability. The pervasiveness of such features begs the question as to the stability of the system overall and the origins of its idiosyncrasies. In the following sections I attempt to probe this stability, placing it within a more general typology of prosodic change and evaluating the incidence of language internal and contact phenomena therein.

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<sup>9</sup>This claim is backed up by the fact that trisyllabic first elements in compounds seem to follow a right-aligned, quantity sensitive trochaic pattern as seen in Table 26

### 3 Reconstructing early Mapudungun stress assignment: 1606–1903

In the following sections I will take a detailed look at the available record for Mapudungun stress and trace its development into the present day. I will divide the historical attestations into three stages, to which I add the contemporary data as a fourth (cf. Table 6).

Stage	Period	Sources
Stage I	Early 17 <sup>th</sup> century	Valdivia (1606),
Stage II	Mid 18 <sup>th</sup> century	Havestadt (1777), Febrés (1765)
Stage III	Late 19 <sup>th</sup> / Early 20 <sup>th</sup> century	Lenz (1893, 1895–1897), Augusta (1903, 1910, 1916)
Stage IV	Late 20 <sup>th</sup> /Early 21 <sup>st</sup> century	Salas (1976, 1992), Molineaux (2014, 2017)

Table 6: Documented synchronic stages for Mapudungun

The data for historical Mapudungun are substantially different from those for more familiar languages, such as Indo-European ones, where historical depth and close genetic affiliation allow for a broader view of the phenomena in context. Our knowledge of Mapudungun, in contrast, begins only in 1606, and comprises very few sources until the 20th century. Also, for lack of conclusive evidence, the language is commonly taken to be an isolate,<sup>10</sup> so all reconstruction efforts must be internal. Furthermore, as no written record exists prior to European arrival, and writing was never widespread amongst native speakers, the older Mapudungun records are all provided by non-native speakers (predominantly missionaries) using spelling conventions based on the languages they were familiar with. As a result, spellings are roughly sound-based, but rely on the non-native speaker's own perceptions of the Amerindian language's sounds, which leads to some difficulties of interpretation. Finally, as no truly consistent marking of stress is given in the available sources (it seems clear that it was never phonemic), and no diagnostic synchronic or diachronic stress-related alternations have been put forth, we must rely mostly on explicit descriptions of stress given in grammars.<sup>11</sup>

In short, the data-presentation in our source documents is not homogenous in form, theoretical outlook, or depth of exemplification. However, there

<sup>10</sup>For an alternative proposal and a review of the literature see (Díaz-Fernández 2011)

<sup>11</sup>As regards the quality of the phonological data we are provided with, we may state that Valdivia and Havestadt's accounts are least detailed, and hence weaker. Febrés is more strongly conscious of matters of pronunciation, though his exposure to the language is less than that of Valdivia and Havestadt. Similarly, Lenz is a trained phonetician, but had only limited access to native speakers. Finally, while Augusta spent forty years in Mapuche territories, he lacked formal linguistic training and, he claims, 'the sensitive ear of Dr. Lenz' (Augusta 1910: XI).

is no doubt that all the works deal with closely related varieties of a single language, and that it should be possible to trace a diachronic path from one stage to another.

### 3.1 Stage I: The turn of the 17th century

The earliest extant description of Mapudungun is Spanish Jesuit Luis de Valdivia's *Art and Grammar* of the language, first published in Lima in 1606. The work was the result of Valdivia's almost 15 years in the Mapuche territories, learning and preaching in the language (see Olivares 2005, Toribio Medina 1894). Valdivia was probably exposed to the now-extinct dialect spoken in and around Santiago, but he traveled widely and claims to document mostly the varieties from 'further south' where 'the language is spoken in its proper form' (1606: 9). In the sixteenth century this most likely referred to the Mapuche heartlands where the predecessors of the central dialect of PDM would have been spoken (cf. Adelaar & Muysken 2004: 508–9).

Meant as a missionary learner's-guide, the grammar was written in the traditional, scholastic model of the day. Needless to say, this type of description is rather inadequate for a language so typologically dissimilar from Latin, the prototype for such manuals. All in all, however, Valdivia did innovate a reasonable amount, creating a range of new categories to deal with his recalcitrant data (Zwartjes 2000). Abstracting away from its theoretical framework, the grammar is very thorough and generally considered a fair description of the language, especially as regards phonology and verbal morphology (Zwartjes 2000: 205–6, Salas 2003: 7, but also Lenz 1895–1897: 16), thus giving a reasonable body of data for this diachronic study.

The stress assignment system for the language is given in the final section of Valdivia's grammar (1606: 74–5). Unfortunately, the rules are extremely parsimonious, no concrete examples are given, and there is no stress marking in the texts or examples elsewhere in his grammar or in his *Sermons*, published in 1621. Although we are told that there are a number of exceptions, the stress system is summed up by three basic rules:<sup>12</sup>

#### (8) Rules for stress assignment, Valdivia (1606: 74–5)

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<sup>12</sup>Here, as in the other sources of early Mapudungun, I have provided my own close paraphrases — not direct translations — of the original Spanish, Latin or German, in order to smooth over some of the idiosyncrasies of the theoretical frameworks and style of the authors. Throughout the early grammars, I have tried not to make matters more difficult for the reader by presenting the transcription system of the authors in detail. Instead, I have followed the author's descriptions and my own PDM data in order to provide the most likely IPA transcription possible. Where these assumptions are not straightforward, I have made my reasoning explicit.



- *Rule 1* All nouns, prepositions, conjunctions, adjectives, adverbs, participles and interjections tend to be stressed on the penultimate syllable.
- *Rule 2* For verbs in the indicative, stress is on the final syllable for the first person; in verbs in the subjunctive, the first person is stressed on the penultimate syllable. For the other persons stress falls on the same syllable as the first person.
- *Rule 3* In the imperative, stress is on the penultimate syllable of the first singular dual and plural, as well as in the dual of the second and third person, but on the final syllable in the second and third person singular and plural. In transitions,<sup>13</sup> stress is on the *-e* or *-mo* that marks them.

If these rules are truly representative of the distribution of Mapudungun stress at the turn of the seventeenth century, they present an important departure from what we find in the contemporary data. We now take a look at the different word categories and attempt to reconstruct their actual patterns, accounting for their distribution.

### 3.1.1 Nominal and adjectival stress

The difference between present-day and turn-of-the-seventeenth-century stress is immediately evident in the case of the nominal and adjectival system. Recall that PDM was claimed to have penultimate mora stress in nouns, while adjectives (as well as adverbs and pronouns) had final stress. Here, nevertheless, we find only one system, which fits neither of these patterns: stress is on the penultimate syllable, regardless, apparently, of weight considerations, as can be seen in Table 3.1.1.<sup>14</sup>

If Rule 1 is accurate, at least from a surface perspective, the system appears to be trochaic, right-aligned and quantity insensitive (i.e. a syllabic trochee, in the sense of Hayes 1995). This, of course, is at odds with the moraic system outlined in Section 2.1 for PDM nouns, as well as with the alternations we find in the perception of stress in light-final disyllables (Molineaux 2017). The system also

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<sup>13</sup>Valdivia, as well as most early grammarians of Mapudungun use the term *transiciones* to refer to the explicit morphological marking of argument relations on verbs (Adelaar 1997, Zwartjes 2000). These forms entail a passing of the verbal action from one argument to another, or doing so reflexively or reciprocally. Crucially, transitions include inversion marking, where there is a reversal of the agency relations of verbs, with satellite person becoming the agent, in place of the default, focal-person agent.

<sup>14</sup>Example (f) is not attested in Valdivia's text. It is given here for comparison with the PDM form in Table (2).

Disyllables		Trisyllables	
a.	[ˈpu.kem] ‘winter’	e.	[a.ˈʃsa.waʎ] ‘hen’
b.	[ˈʎaf.keɲ] ‘sea’	f.	[a.ˈtʃuʎ.peɲ] ‘floating ash’
c.	[ˈma.pu] ‘land’	g.	[ma.ˈwi.θa] ‘woodland’
d.	[ˈpiw.ke] ‘heart’	h.	[pun.ˈpu.ʎa] ‘armpit’
i.	[ˈe.ɲum] ‘hot’		
j.	[ˈwe.θa] ‘bad’		
k.	[ˈwi.le] ‘tomorrow’		
l.	[ˈiɲ.tʃe] ‘I/me’		

Table 7: Early 17c stress in nouns, adjectives, adverbs and pronouns, after Valdivia (1606)

contrasts with the PDM tendency for adjectives, adverbs and pronouns to be stressed on the final syllable, regardless of weight.

Another important aspect of the nominal system, as regards stress placement, is that where later grammars usually break up a sequence of tautosyllabic consonants by claiming the presence of a [i] or [ə] (see Section 4.3), Valdivia assures us that the clusters are acceptable and do not syllabify separately:

... in this language of Chile two consonants often precede or follow a vowel... and it should not be thought that therefore there is a new syllable besides the vowel, for there is no more than one. (Valdivia 1606: 3 — my translation)

Although we shall see that verbs show clear evidence for some form of epenthesis at morpheme boundaries (cf. ??), the process seems less clear for nouns, a fact that is also evidenced by the forms in the *Vocabulary* that concludes his grammar.

- (9) a. [pʎi] ‘soul’  
b. [dɲu] ‘word’  
c. [mamʎ] ‘wood’  
d. [ʃsaɲʎ] ‘finger’

It is possible that, as in the case of verbs, epenthesis escapes Valdivia’s awareness in nouns. However, if it does exist, the process doubtless post-lexical. If it were lexical, epenthesis would most likely interact with stress assignment (at least in the initial consonant clusters), in which case we would expect a stressed

vowel to be salient enough to warrant transcription (\*⟨püllī⟩ ‘soul’ or \*⟨mamüll⟩ ‘wood’ in Valdivia’s transcription), which is evidently not the case.

### 3.1.2 Verbal stress

Rules 2 and 3 in (8) present a picture of verbal stress that is fundamentally determined by morphological structure, rather than by the phonology of the language. Stress appears to be a feature of the inflectional paradigms, rather than an phonological rule computed from a constituent edge. As the first person singular of the indicative is [-n] and that of the subjunctive, [-li], stress will always surface on the vowel immediately preceding mood-marking (i.e. a final syllable closed by [-n] or a penultimate syllable, followed by [-li]). The vast majority of the imperative paradigm is also stressed on the vowel preceding mood-marking: here, the root-final vowel. The key exceptions are the port-manteau morphemes marking the second singular and third person ([-ŋe] and [-pe]), which take stress, even if they are the final syllable. Assuming Valdivia’s rules, and with the rudiments of Mapudungun verbal structure outlined above, we may reconstruct early seventeenth century verbal stress for vowel-final roots as in Table 8. The main difference in the structure of the sixteenth century paradigms, as compared to the twenty-first century ones (see Table 4), seems to be the lack of an epenthetic in the second person plurals (Valdivia has ⟨-mn⟩, where PDM has ⟨mün⟩) and the surfacing of the first person marker as [j] (⟨y⟩ in Valdivia’s orthography) in the dual subjunctive (cf. [ʃsi.'pa.-lju] here versus [ʃsi.'pa.-li.ju] in Table 4). Both these differences are in line with the greater acceptability of consonant clusters in Valdivia’s period, as opposed to PDM.

		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	SG	[ʃsi.'pa-n]	[ʃsi.'pa-j.mi]	[ʃsi.'pa-j]
	D	[ʃsi.'pa.-ju]	[ʃsi.'pa-j.mu]	”
	PL	[ʃsi.'pa.-iɲ]	[ʃsi.'pa-j.mn]	”
SUBJ	SG	[ʃsi.'pa.-li]	[ʃsi.'pa-l.mi]	[ʃsi.'pa.-le]
	D	[ʃsi.'pa.-lju]	[ʃsi.'pa-l.mu]	”
	PL	[ʃsi.'pa.-liɲ]	[ʃsi.'pa-l.mn]	”
IMP	SG	[ʃsi.'pa.-tʃi]	[ʃsi.pa.-'ŋe]	[ʃsi.pa.-'pe]
	D	[ʃsi.'pa.-ju]	[ʃsi.'pa.-mu]	”
	PL	[ʃsi.'pa.-iɲ]	[ʃsi.'pa.-mn]	”

Table 8: Verbal paradigm for vowel-final root [ʃsipa-] ‘exit’, after Valdivia (1606)

Although Valdivia does not deal with the issue of consonant-final versus vowel-final roots, the data he provides in the *Vocabulary and Confessionary* that close his grammar, and his *Sermons* (Valdivia 1621), point to a series of verbs with epenthetic ⟨i⟩ breaking up consonantal clusters at the root/inflection boundary, as in (10).

- (10) a. ⟨kim-i-n⟩  
 know-EP-1SG:IND  
 ‘I knew’  
 b. ⟨kim-i-l-m-n⟩  
 know-EP-SUBJ-2-PL  
 ‘if they knew...’

Valdivia appears to be somewhat inconsistent in his use of the epenthetic form (cf. ⟨elu-duam-n⟩ ‘give-DES-1SG:IND’ 1606: 14) making it an unlikely candidate for stress. I will therefore assume that, in the case of consonant-final roots (that show the ⟨i⟩ ~ ∅ alternation), said vowel (transcribed here as [i], following PDM) is disregarded for stress-assignment purposes. Ultimately, this means that Rule 2 in (8) places stress on the final syllable of the verbal root, excepting the second singular and third person imperatives [-ŋe] and [-pe], as shown in Table 9.

		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	SG	['ko.n-in]	['ko.n-i.mi]	['ko.n-ij]
	D	['ko.n-i.ju]	['ko.n-i.mu]	”
	PL	['ko.n-ip]	['ko.n-i.mn]	”
SUBJ	SG	['kon.-li]	['ko.n-il.mi]	['kon-.le]
	D	['kon.-lju]	['ko.n-il.mu]	”
	PL	['kon.-lip]	['ko.n-il.mn]	”
IMP	SG	['kon.-tʃi]	[kon.-'ŋe]	[kon.-'pe]
	D	['ko.n-ju]	['kon-.mu]	”
	PL	['ko.n-ip]	['kon-.mn]	”

Table 9: Verbal paradigm for the consonant-final root [kon-] ‘enter’ after Valdivia (1606)

Nevertheless, the rules in (8) seem to imply that the addition of tense or aspect suffixes changes the placement of stress, as in (11), thus requiring a new analysis.

- (11) a. [e.lu.-'bu-n]  
           give-BI-1SG:IND  
           'I used to give'
- b. [kim.-du.'a.m-i-l.-m-n]  
           know-DES-EP-SUBJ-2-PL  
           'I wish they knew'
- c. [kon.-'la-n]  
           enter-NEG-1SG:IND  
           'I didn't enter'

We may then consider stress as a stem phenomenon, where the stem would include the root and the tense and aspect marking, excluding mood, person and number — the OFI. This idea is furthered by the fact that the forms with 'transitions' are stressed on the [-e] and [-mo] suffixes that mark the satellite person (SP) agent in inverse forms (see Rule 3 in 8), and which always precede the OFI.

- (12) a. [elu-'e-j-m-u]  
           give-3SP-IND-2-D  
           'He<sub>SP</sub> gave you both<sub>FP</sub>'
- b. [elu-'mo-j-u]  
           give-2D:SP-1IND-D  
           'You two<sub>SP</sub> gave us both<sub>FP</sub>'

Still, we have the problem of the final-stressed imperative forms, which are portmanteaus marking mood, person and number. It is evident that such affixes ([-ŋe] and [-pe]) are synchronically simplex, since they do not mark person and number according to the predominantly agglutinating pattern outlined above (cf. Table 3). It is possible that these forms are different in that they represent remnants of historical auxiliary verbs which have become positionally fixed, but have not yet fully grammaticalised as regards stress.<sup>15</sup> If, phonologically, [-ŋe] and [-pe] represent independent prosodic words, we may assume that they are stressed separately as well.

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<sup>15</sup> Speculatively, [-ŋe] can be related to the root [ŋe-] 'to be' and [-pe] can be related to the root [pe-] 'to see'. Also speculatively, [-tʃi] ('IMP.1.S') may correspond to the demonstrative [tʃi], so it would not be predicted to bear stress, originating in an unstressed, functional element.

These exceptions aside, verbal stress in the early seventeenth century Mapudungun of the dialects described in Valdivia’s grammar display stress on the stem-final vowel, with the stem being defined as the entirety of the verbal form minus the OFI.

In sum, early 17<sup>th</sup> century Mapudungun appears to assign stress to right-aligned trochees in nouns, just as PDM does. However, in contrast to PDM, this early system is quantity insensitive, and extends to other non-verbal categories. In verbs, the data from Valdivia suggests a stress pattern that is fundamentally morphological in nature, marking the final syllable preceding obligatory inflectional marking.

### 3.2 Stage II: The mid-eighteenth century

For a century and a half, Valdivia’s grammar was the only widely available description of the Mapuche’s language, and it continues to be an invaluable resource for its history. The mid-eighteenth century, however, saw the arrival of two Jesuits who would endeavour to update the work of their predecessor.

The first of these grammarians was Bernhard Havestadt (1714-1778), a Westphalian, who arrived in the Mapuche territories in 1748, remaining for twenty-two years. His grammar, though apparently available in a Spanish-language manuscript in the mid-1750’s, was published in Latin only in 1777 as *Chilidúgu: Sive Tractatus Linguae Chilensis*.<sup>16</sup> This work — part grammar, part compilation of texts, and part travel-log — spans three volumes and nearly one thousand pages. In its structure, it mirrors Valdivia’s work, adhering even more vehemently to the scholastic approach. In dialectal terms, Havestadt’s grammar was probably most influenced by the predecessors of Northern Mapudungun, although the author was no doubt aware of dialectal differences, having travelled widely and encountered varieties from the areas of all major dialect groups (North, Central and South).

The second eighteenth-century grammar was that of a Catalan Jesuit, Andrés Febrés (1732-1790). Somewhat younger than Havestadt, he appears to have learnt the language and written his grammar less than five years after his arrival in Chile, in 1759. It seems, however, that Febrés came into contact with Havestadt’s *Chilidúgu* — in Spanish manuscript form — well before reaching the country (see Lenz 1895-1897: XLI-LI, and Havestadt 1777: 189). Febrés’ grammar was, nevertheless, published before that of his German brother of the cloth, and is much more condensed, so was used more widely. Importantly, Febrés’ grammar clearly outdoes that of Havestadt in its care in transcribing the sounds

<sup>16</sup>The acute marks in the spelling *Chilidúgu* do not represent stress, rather the ‘special ⟨u⟩’ — which I transcribe as [i] elsewhere — and the ‘Spanish ⟨ng⟩ sound’ — which I transcribe as [ŋ]. Hence, ⟨Chilidúgu⟩ = [tʃili-θiŋu] ‘Chile-speech’.

Disyllables			Trisyllables		
a.	[pu.'kem]	‘winter’	e.	[a.ʃ̥sa.'waʎ]	‘hen’
b.	[ʎaf.'keɲ]	‘sea’	f.	[a.tʃuʎ.'peɲ]	‘floating ash’
c.	[e.'ɲum]	‘hot’	g.	[ma.'wi.θa]	‘woodland’
d.	[ʎwe.θa]	‘bad’	h.	[pun.'pu.ja]	‘armpit’

Table 10: Stress in nouns and adjectives (Havestadt 1777, Febrés 1765)

of the language, as is shown by abundant comment on pronunciation matters and exemplification. Febrés is likely to have gathered most of his material from his sojourns in Angol and Imperial, where dialects were probably the predecessors of Northern and Central Mapudungun, respectively.

In terms of the presentation of verbal morphology, both eighteenth-century grammarians follow Valdivia quite closely, and hence, their analysis falls in with that set out in Table 3, above. As for the issue of stress assignment, Havestadt and Febrés’ grammars differ in their presentation, but converge — for the most part — on the loci of stress. Although both grammars present stress in far more detail than Valdivia does, they are still very condensed, and we must do our best to tease out the details of their proposed systems.

### 3.2.1 Nominal and adjectival stress

Both Havestadt (1777: 2) and Febrés (1765: 6-8) give us a clear pattern for nouns and adjectives: stress the ultima if it ends in a consonant,<sup>17</sup> otherwise, stress the penultimate syllable — a pattern we recognise from PDM nouns, in Table 2. This account is clearly at variance with that of the preceding grammar, where Valdivia depicts a quantity-insensitive system. Although the data is by no means exhaustive, it seems a reasonable assumption that in the period and dialects that Havestadt and Febrés cover, monomorphemic nominal and adjectival stress falls on a right-aligned moraic trochee, as in Table 10.

The only apparent exception to this trochaic pattern — aside from the stress-shifting contexts detailed in Section 3.2.2 — is given by Febrés (p.7), who claims that nouns with a final consonant preceded by [i] are stressed on the penultimate syllable ([ʎne.mil] ‘word/concept’, [ʎma.míʎ] ‘wood’, [ʎpe.lim] ‘guest’). As I have already claimed for the early-seventeenth-century data, [i] appears to be the default epenthetic vowel. It seems, however, that by this period epenthesis in coda clusters is far better established than in the early seventeenth century (cf. 9). This also seems to be the case in onset clusters: where Valdivia has [pʎi]

<sup>17</sup>Febrés (1765: 6) actually says that default stress falls on a final syllable if it ends in a consonant or ‘diphthong’, i.e. ⟨au, eu, ay, ey⟩, etc. (probably [aw], [ew], [aj], [ej], etc.).

‘soul’ and [dɲu] ‘word’, Febrés has [piʎi] and [diɲu]. Although we are not given the stress patterns of these latter words, we assume it was final, as it seems to have been in both Stage I and Stage III. Ultimately, since the epenthetic vowels do not appear to interact with stress in the eighteenth-century data, we assume that they are not part of the lexical representation and are added following stress assignment (cf. Table ), so such words pose no major threat to the trochaic analysis.

Of course, while this moraic trochee analysis broadly fits the description for PDM nouns, it remains at odds with PDM adjectival forms, where stress is invariably word-final. Although we are provided with no explicit statements regarding adverbs and pronouns, I assume that these must follow the general rule stated by Febrés, thus contrasting with the state of affairs of PDM, where these parts of speech behave like adjectives.

### 3.2.2 Stress shifting in Febrés (1765)

Havestadt’s first assertion on Mapudungun stress is that it is often ‘ambiguous or according to taste’ (1777: 20). However, we have seen that — at least for PDM — this variability is highly restricted, manifesting mostly in vowel-final disyllabic nouns. A closer look at the first seemingly naturalistic speech recorded for the language shows this variation to be similarly restricted in the eighteenth century. Indeed, Febrés provides the reader with two transcribed dialogues, the second of which he marks for phrase-final prominences (1765: 146-156), which he claims are typical of formal speech.

When they speak in the tone that befits a speech, which they call *coyaghtun* ([kojauɲtun]), all the words at which they make a pause are pronounced long, e.g. *deuma pepavin gami mapú, marimari ca Llancahuenu, Dios pile, pentuayu ca mitá*, etc. ‘I have already come to see your land, oh Llancahuenu! If God is served, we shall meet again’; where they pronounce the three words *mapu, Llancahuenu, mita* long, not because they are, but because they raise their voices further on these, and make a pause (8 – my translation).

In the note that precedes his extended example of one such speech, he tells us:

I warn here that all the words that have an accent mark on the final syllable and are followed by a star, denote that upon that final syllable and word they make a pause, raise their voice, pronouncing it as long and taking a breath for the next clause, which is the way to give a *coyaghtun* (145 – my translation).



Upon closer inspection of the actual marking in the text (near 150 clauses), the vast majority of words marked for final stress are words where stress on the ultima is expected: monosyllables ([ˈpi-n] ‘call-IND.1s’),<sup>18</sup> and words ending in a consonant ([kiˈθaw] ‘work’; [kupiˈfal] ‘poor person’, [iˈmen] ‘rich person’, [ʔavˈken] ‘sea’, [kime-ˈa-j] ‘good-FUT-IND.3’). The only cases where final stress is unexpected is in vowel-final disyllabic nouns ([paˈje] ‘priest, father’; [maˈpu] ‘land’), and the proper names of the two main speakers, [miˈla-leˈvu] ‘gold-river’ and [anka-teˈmu] ‘body-temo.tree (*Blepharocalyx cruckshanksii*)’. Although the cases of final stress in these proper names are interesting, they can hardly be said to reflect the language’s general pattern. The evidence seems to point, rather, to the fact that this alternation is mostly restricted to disyllabic nouns ending in a vowel.

The phenomenon of stress shifting in formal speech — if described correctly by Febrés — seems to be a consequence of intonational processes. It is not difficult to imagine that Febrés’s perception of stress comes from an extreme pitch contour at the clause-edge (possibly a high intonational pitch accent: H\*) in such spoken-discourse formulae (indeed, in Molineaux 2014 I find pitch maxima to be the strongest correlate of PDM stress). It seems interesting, however, to ask whether this L2 interpretation of final stress in these forms would have been perceived as such by native speakers, or whether they would have simply seen these phenomena as changes in the language’s intonation-contour (cf. Molineaux 2017: for PDM data). The fact that the pattern is found almost exclusively in disyllables will be key to our understanding of the later development of stress in the language (cf. Section 4, below).

### 3.2.3 Verbal stress

At a first glance, verbal stress is described in a very similar fashion to nouns: stress the final if closed, otherwise, stress the penultimate. Again, it is made plain that this excludes epenthetic vowels, which are never stressed, such as those in the first person singular indicative (e.g. [ˈkim-(i)n] ‘know-IND.1s’), and in the second and third person plural for all moods (e.g. [eˈlu-m(i)n] ‘give-IMP.2P’). As in the previous stage, the second and third person singular of the imperative are stressed on a final open syllable. Like in the seventeenth-century data, I assume these morphemes are somehow not fully grammaticalised, at least as regards the computation of stress.

<sup>18</sup>Interestingly, postpositions such as [mew] are often stressed when final, as are particles such as [ve], which is described as interrogative or ornamental. Demonstratives and pronouns also appear in the clause-final position having stress on their only underlying vowel: cf. ⟨tva⟩ ~ [tiˈva] ‘this, thus’; ⟨eɲn⟩ ~ [eˈɲin] ‘they two’.

The syllabification of the first person dual of the subjunctive, given as ⟨-liu⟩ in both grammars, differs from that given by Valdivia: ⟨-lyu⟩. Regular epenthesis means that by this stage clusters are probably not permitted, so ⟨-liu⟩ is unlikely to represent [-lju], as in the previous stage (see Table 8). It is more likely that this represents a sequence of vowels in hiatus ([-li.u]) where the first attracts stress according to the general rule for the period.

A more unexpected pattern is that of the first person plural of all moods, which bears stress on the penultimate syllable,<sup>19</sup> that is, on the vowel immediately preceding a final closed syllable. We can summarise these assumed stress-patterns for vowel- and consonant-final verb-roots in tables (11) and (12), respectively. We note, however, that we have followed Febres in the case of stress on the first person dual indicative of open syllables. Havestadt’s claims that ‘all first persons of the indicative’ bore final stress, would predict stress on a final open syllable for [ʃi.pa.-’ju], a pattern that would be at odds with all other historical data, as well as Febrés’ contemporary grammar. I assume, therefore, that the dual — which would have been the least familiar to a speaker of German and Spanish — was simply overlooked.

		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	SG	[ʃi.'pa-n]	[ʃi.'pa-j.mi]	[ʃi.'pa-j]
	D	[ʃi.'pa.-ju]	[ʃi.'pa-j.mu]	”
	PL	[ʃi.'pa.-ip]	[ʃi.'pa-j.mɪn]	”
SUBJ	SG	[ʃi.'pa.-li]	[ʃi.'pa-l.mi]	[ʃi.'pa.-le]
	D	[ʃi.pa.-'li.u]	[ʃi.'pa-l.mu]	”
	PL	[ʃi.'pa.-lip]	[ʃi.'pa-l.mɪn]	”
IMP	SG	[ʃi.'pa.-tʃi]	[ʃi.pa.-'ɲe]	[ʃi.pa.-'pe]
	D	[ʃi.'pa.-ju]	[ʃi.'pa.-mu]	”
	PL	[ʃi.'pa.-ip]	[ʃi.'pa.-mɪn]	”

Table 11: Verbal paradigm for vowel-final root [ʃipa-] ‘exit’, after Havestadt 1777 and Febrés 1765 (forms contradicting the ‘general rule’ shaded).

The case of consonant-final roots, in particular in the indicative, is radically different from what we find in the early seventeenth century. Key to the positioning of stress here is the alternation between non-nuclear [j] and nuclear

<sup>19</sup>Havestadt and Febres share this percept for the first person plural of the subjunctive, but only data from Febrés is available for the imperative. In the case of the indicative, the two Jesuits disagree, with Havestadt stressing the final syllable and Febrés, the penult. Here I follow Febrés, whose data is more complete.

		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	SG	[ˈko.n-ɪn]	[ko.ˈn-i.mi]	[ko.ˈn-ij]
	D	[ko.ˈn-i.ju]	[ko.ˈn-i.mu]	”
	PL	[ˈko.n-ɪp]	[ko.ˈn-i.mɪn]	”
SUBJ	SG	[ˈkon.-li]	[ˈko.n-ɪl.mi]	[ˈkon.-le]
	D	[kon.-ˈli.u]	[ˈko.n-ɪl.mu]	”
	PL	[ˈkon.-liɪp]	[ˈko.n-ɪl.mɪn]	”
IMP	SG	[ˈkon.-tʃi]	[kon.-ˈɲe]	[kon.-ˈpe]
	D	[ko.ˈn-i.ju]	[ˈkon.-mu]	”
	PL	[ˈko.n-ɪp]	[ˈkon.-mɪn]	”

Table 12: Verbal paradigm for the consonant-final root [kon-] ‘enter’, after Havestadt 1777 and Febrés 1765 (forms contradicting the ‘general rule’ shaded)

[i] for the indicative marker. Havestadt tells us explicitly that the alternation depends on whether the segment is preceded by a vowel, in which case it has the value ⟨y⟩ (meaning [j] – 1777: 26). The result is that all forms of the second person, alongisde the first person dual, stress the indicative marker — not the last pre-OFI syllable, as in Valdivia’s account (cf. Section 3.1.2).<sup>20</sup>

Besides first person plural forms, penultimate-mora stress also fails to fall on the non-finite markers [-el] and [-ɪm], in Febrés’ data. Furthermore, inverse marker [-e] is stressed by Febrés despite being followed by a closed syllable (as in the 17<sup>th</sup> century, cf. Table 12). In all these cases, some synchronic alternation seems to be afoot, sometimes stressing the penultimate mora, and sometimes the last pre-OFI syllable, as can be seen in Table 13.

	‘give-IND-1PL’	‘give-TEMP’	‘give-NMLS’	‘give-INV-3IND-3SP’
Havestadt	[e.lu.-(ˈi-p)]	[e.lu.-(ˈj.ɪm)]	[e.lu.-(ˈel)]	—
Febrés	[eˈlu-(i-p)]	[e.ˈlu-(j.ɪm)]	[e.ˈlu.-(el)]	[e.lu.-ˈe-(j-ew)]

Table 13: Stem-final vs. penultimate mora stress in Havestadt and Febrés

We note then, that in all these forms, where stress does not follow the general rule, it seems to revert to what we find in the previous stage: stress on the last vowel before the OFI. The only exceptions are imperative [-ɲe] and [-pe].

<sup>20</sup>In the 2<sup>nd</sup> person plural, Havestadt (1777: 5) assumes that, although unwritten, there is a very brief vowel between the final consonants ⟨(ù)⟩, in his script, [i] here).

It is my claim, then, that the stem-final syllable does have some degree of stress, which is normally demoted in favour of stress on the penultimate mora of the word. This would imply that, in building the verb's morphological structure, stress assignment rules are applied twice, once to the stem and once to the word.<sup>21</sup>

### 3.2.4 Summary of mid-eighteenth century stress assignment

Havestadt's claim that many words are simply "ambiguous or according to taste" as regards stress (1777: 20) appears to be symptomatic of a system in flux, though an appropriate linguistic generalisation was needed to restrict and explain the variation. The phrasal and pragmatic phenomena described by Febrés may be partially responsible for Havestadt's observations, but the inconsistencies between the two grammarians point to other factors that are unstable within the system.

The picture I present for stress in this period is in many ways similar to what we find in the present-day account. The most important similarity is the practically exceptionless footing of a right-aligned moraic trochee at the word level. This is particularly true for the nominal system, excepting the cases with variable stress in PDM. The second similarity is the tendency to stress the stem-final vowel in verbs. One of the major differences, however, is the fact that what appears to be the stem domain in the eighteenth century (and in the early seventeenth as well — all verbal morphology excluding the OFI) is significantly different to what the data yielded for the stem-domain in the twenty-first century (root plus core diathesis-changing suffixes, cf. Section 2.2).

Interestingly, considering the possible structures of mood, focal person and number suffixes, there are only two possible distributions for the verb's two stresses: conflation or clash. This less than ideal distribution of stresses, I venture, most likely led speakers, over time, to avoid clash by re-conceptualising the domains of the stem and word-morphology. We will ultimately see this reassessment of the stem-domain and the role of demarcative stress in the final historical works on the language, in Section 3.3 as well as in my own, twenty-first century data, which I will return to in Section 4.

## 3.3 Stage III: The turn of the twentieth century

Towards the end of the nineteenth century, the work of Rudolf Lenz, a German-born linguist and philologist, opened up the field of Mapuche Studies to university academics. Based in Santiago from 1890 until his death, in 1938, Lenz focused first on the peculiarities of Chilean Spanish, which he claimed was "ba-

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<sup>21</sup>For a more detailed, formal analysis of this data see Molineaux (2014: 260–4).

sically Spanish with Araucanian sounds” (1893: 208). He soon turned his interest to Mapudungun itself, however, travelling repeatedly to Mapuche territories and making detailed notation of stories, poems, speeches and dialogues. His main works on Mapudungun — written between 1895 and 1897 — were compiled in *Estudios Araucanos*, where the dialectal origins of the different texts are made explicit. While the southern variety is underrepresented, there are lengthier texts representing northern and central dialects. For the first time in Mapudungun studies, the work did not have a pedagogical objective (as in the missionary grammars), but rather attempted a careful, scientific description.

In parallel, Felix de Augusta, part of a new contingent of Bavarian Capuchins, took on the task of renewing the missionary materials for working with the Mapuche, now forcibly relocated to reservations. His *Gramática Araucana* (1903) is the result of Augusta’s first eight years of work in Chile’s Araucanía Region, where the central branch of the language is spoken. It is perhaps the most manifestly ‘pedagogical’ of the missionary works, structured as a series of brief grammar points followed by examples and exercises, as was the model of the day for learner grammars. Although the *Gramática* is Augusta’s most explicit work on the language’s structure, it should be taken as part of a trilogy — alongside his collection of texts, *Lecturas Araucanas* (1910), and superb bilingual dictionary (1916) — which provide a broader practical description of the language (Salas 1985, Molineaux 2016b).

Lenz’s views on the phonetics and phonology of the language are sprinkled quite generously throughout his work. The most extensive account is given in the prologue to his collected articles on Mapudungun (Lenz 1895-1897), where, with regards to stress, he states that it “has little strength and stability, changing its place according to laws of balance that are scarcely fixed” (XXIV). However, in a footnote elsewhere in the volume, he agrees with Febrés in claiming that “words are stressed on the penultimate syllable; only when ending in a consonant do they become acute” (388 fn.I).

Augusta’s account of stress is stated early on in his first work on Mapudungun, giving a ‘general rule’, followed by a series of partial or superficial exceptions. As in the case of Lenz (as well as Havestadt and Febrés) he places stress on “the last syllable when it is closed or has a diphthong [i.e. a vowel plus a glide] and the penultimate elsewhere” (1903:2-3). Although, overwhelmingly, stress is not marked in Lenz or Augusta’s transcriptions, where it is specified, this general pattern is usually upheld.

### 3.3.1 Nominal and adjectival stress

In a 1893 article, preceding his *Estudios*, Lenz is more precise than anywhere else regarding Mapudungun stress:

Stress varies in accordance with lexical combinations; in general, words ending in a consonant are stressed on the last full syllable (those which do not include [ə]), while simplex, polysyllabic words ending in a vowel, are stressed on the penultimate syllable. (202 – my translation)

The overall result is identical to that of the eighteenth-century grammarians (see the examples in 10). As for lack of stress on final syllables with a schwa, this also agrees with Febrés claims (see Section 3.2.1). It is interesting, however, that in Lenz’s texts, stress is indeed sometimes marked on a final syllable with epenthetic vowel [i] (cf. [vo.'tɪm] ‘son’ p.95 and [ɲa.'mɪɲ] ‘foot’ p.230), which is elsewhere considered interchangeable with schwa.

Augusta’s assessment of nominal stress is very similar to that of Lenz (and hence to Febrés and Havestadt, cf. Ex. 10), as it derives from his ‘general rule’ (penultimate mora stress). There are two exceptional cases, nonetheless: “disyllables that have a schwa in the first syllable are stressed on the last syllable regardless of the general rule”, and “disyllables that have a schwa in the final syllable have two stresses (a spondee)” (1903:4). Examples are: [pə.'li] ‘soul’, [pə.'ɬi] ‘fly<sub>N</sub>’ and ['fo.'təm] ‘son’; ['ma.'məɬ] ‘wood’. If indeed the dialect that Augusta describes has this distribution, we could explain the forms with stress on a final open syllable, as well as the cases of ‘spondee’ stresses, by assuming that epenthesis is still an active part of Mapudungun’s system, breaking up tautosyllabic clusters, and right-edge stress is applied cyclically. In other words, stress is assigned once before epenthesis, and once after, as suggested in Table 14. Be this as it may, taken together with the data from Lenz, Febrés and PDM, it seems clear that the interaction between stress and nominal epenthesis is not altogether settled, and, indeed, the historical epenthetic vowel might be in the process of entering the lexical representation of at least some of the dialects and words of eighteenth-century Mapudungun.

	Underlying	Stress	Epenthesis	Stress	Surface	Gloss
a.	/pli/	'pli	pə.'li	–	[pə.'li]	‘soul’
b.	/fotm/	'fotm	'fo.təm	'fó.'təm	['fo.'təm]	‘son’

Table 14: Stress and epenthesis in nouns, based on Augusta (1903)

Interestingly, although neither Lenz nor Augusta explicitly mention stress in other word categories than nouns and verbs, in both authors’ collections of texts (especially Lenz’s), stress is often marked on the final open syllable of disyllabic adjectives, adverbs, pronouns and demonstratives (cf. Lenz: [mu.'na] ‘few’,

[wi.'le] 'tomorrow', [ki.'ne] 'one/DET' and [tu.'fa] 'this', Augusta: [we.'θa] 'bad', [fi.'ta] 'old'). I assume, then, that this is the normal position of stress in such words, since we find no instances where their stress is marked initially.

### 3.3.2 Stress-shifting

The major exception to the nominal pattern are the — by now familiar — disyllables ending in a vowel. In the prologue to his *Estudios* Lenz exemplifies the ‘scarcely fixed’ nature of stress in words such as *ruka* ‘house’, giving the forms in (13a–b). Upon closer inspection, it becomes evident that it is vowel-final disyllables that account for this variable stress pattern, as is plain in comparing (13c–d).

- (13) a. [tə.'fa.-mu mə.l-i ji 'ru.ka]  
DET-POST be-3SG:IND my house  
'Here is my house'  
(Lenz 1895-1897: XXIV)
- b. [ji ru.'ka mo kə.'pa-n]  
my house from come-IND-1SG  
'I come from my house'  
(Lenz 1895-1897: XXIV)
- c. [wu.ʃsa.-'la-j tʃi 'loŋ.ko]  
stand-NEG-3SG:IND the chief  
'The chief did not stand up'  
(Lenz 1895-1897: 18)
- d. [mi.le.-fu ka.θi.ke, loŋ.'ko]  
be-BI leader chief  
'they were leaders, chiefs'  
(Lenz 1895-1897: 18)

We note that, although the lack of stability is claimed for the language overall, the alternate position of stress on a final open syllable is restricted to two-syllable words, in particular, nouns. Clearly the forms that do not follow the general rule seem most common clause-finally, or preceding the postposition [mo]/[mew] (a claim explicitly made by Augusta 1903: 4), but this behaviour is not consistent for such a position, nor exclusive to it.<sup>22</sup>

<sup>22</sup>Note, for instance the transcription [ˈma.pu mo] in Lenz's texts (p.34), and the position

As for Augusta, his actual transcripts do not diverge from the rules given in the grammar and the introduction to the *Lecturas*, except in the case of the adjectives. Nowhere in the transcriptions — and in contrast to Lenz’s contemporary texts — do we find stress marked on the final open syllable of a noun in isolation. This, in my view, seems symptomatic of Augusta’s representation of a lexical pattern, rather than the surface, post-lexical one, which Lenz would have had access to.<sup>23</sup> The key difference here is that Augusta is likely to have been one of the most proficient of the L2 speakers of Mapudungun to write a grammar of the language, while Lenz — a very competent phonetician — would have lacked the long-term exposure necessary to tease apart the lexical and post-lexical patterns of prominence.

### 3.3.3 Verbal stress

While Lenz gives no explicit guidance regarding verbs, in Augusta’s work stress follows the general rule in the first person singular of all moods, with other conjugations following this form’s stress (see Table 15). Only in the subjunctive does Augusta claim an exception, with the first person dual and plural not following the singular’s pattern, but rather following the general rule.

The resulting system, in Table 15, is one where the overwhelming majority of OFI-paradigm forms, in vowel-final roots, are stressed on the penultimate mora. The exception to this pattern — as in the data for the 18th century — are the first person plural of the indicative and the imperative (greyed out), which have their stress on the root-final syllable. However, the subjunctive form no longer has exceptional, pre-OFI stress, and the second and third person singular of the imperative have come under the general rule.

For roots ending in a consonant, Augusta claims the existence of an epenthetic vowel, which in the first person singular of the indicative is often stressed ([e.ˈl-ən] ‘put-1SG:IND’). This is the case if the root is monosyllabic (i.e. [el-], ‘put’; [wəl-] ‘give’). Otherwise, in polysyllabic roots, stress is assigned to the preceding vowel ([kuˈʃan-ən] ‘sicken-1SG:IND’).<sup>24</sup>

of stress in phrase-final [ˈma.pu] and [ˈloŋ.ko] in (13a) and (13c), respectively. Although rare, there are a few examples of disyllables transcribed with stress on a final vowel, even when not phrase final, as in [pi.tʃi ˈma.pu ru.ka mi.le.-ka.-j-a-j] ‘bit earth house be-CONT-FUT-3IND (there won’t be much distance to the house)’(97). It is possible, of course, that the speaker placed an intonational break following the word [ru.ka], which brought with it the change in perceived stress.

<sup>23</sup>Augusta tells us that “aside from the prosodic stresses, we also find declamatory or emphatic stresses which allow a certain syllable to be reinforced outside the rules of stress assignment” (1910: XI). No specific conditions for this reinforcement are given, nevertheless.

<sup>24</sup>Augusta also claims that, in consonant-final roots, the third person singular of the in-



		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	S	[ʃi.'pa-n]	[ʃi.'pa-j.mi]	[ʃi.'pa-j]
	D	[ʃi.'pa.-ju]	[ʃi.'pa-j.mu]	”
	P	[ʃi.'pa.-iɲ]	[ʃi.'pa-j.mɪn]	”
SUBJ	S	[ʃi.'pa.-li]	[ʃi.'pa-l.mi]	[ʃi.'pa.-le]
	D	[ʃi.pa.-'li.ju]	[ʃi.'pa-l.mu]	”
	P	[ʃi.pa.-'liɲ]	[ʃi.'pa-l.mɪn]	”
IMP	S	[ʃi.'pa.-tʃi]	[ʃi.'pa.-ɲe]	[ʃi.'pa.-pe]
	D	[ʃi.'pa.-ju]	[ʃi.'pa.-mu]	”
	P	[ʃi.'pa.-iɲ]	[ʃi.'pa.-mɪn]	”

Table 15: Verbal paradigm for vowel-final root [ʃipa-] ‘exit’, after Lenz 1895-1897 and Augusta 1903

		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
IND	S	[ko.'n-in]	[ko.'n-i.mi]	[ko.'n-ij]
	D	[ko.'n-i.ju]	[ko.'n-i.mu]	”
	P	[ko.'n-iɲ]	[ko.'n-i.mɪn]	”
SUBJ	S	['kon.-li]	['ko.n-ɪl.mi]	['kon-.le]
	D	[kon.-'li.ju]	['ko.n-ɪl.mu]	”
	P	[kon.-'liɲ]	['ko.n-ɪl.mɪn]	”
IMP	S	['kon.-tʃi]	['kon.-ɲe]	['kon-.pe]
	D	[ko.'n-i.ju]	['kon-.mu]	”
	P	[ko.'n-iɲ]	['kon-.mɪn]	”

Table 16: Verbal paradigm for the consonant-final root [kon-] ‘enter’, after Lenz 1895-1897 and Augusta 1903

As we see in Table 16, the position of stress for consonant-final roots is fully consistent with the right-aligned moraic trochee of nouns. Still, the picture for the epenthetic vowel in verbs seems murky at best. Although nowhere in Augusta’s texts is stress marked on these epenthetic vowels,<sup>25</sup> we do find cases

dicative receives stress on the vowel preceding the inflection, given the example of [ku'ʃʂan-ij] ‘sicken-3SG:IND’. This example is problematic, seeing as how it is a denominal verb, and may attract additional stress to the root-final syllable. Also, in his own texts, Augusta marks stress on the final syllable of such cases: eg. [ʌo.'w-i-j] ‘receive-IND-3S’ (1910:37).

<sup>25</sup>The marking of stress on schwa and ⟨ù⟩ (PDM [i] in Augusta’s texts) presented important

where Augusta does not transcribe the epenthetic vowel itself after a monosyllabic root (cf. ⟨kim-n⟩ ‘know-1SG:IND’, 204). Furthermore, in Lenz’s work, although we do find cases of stressed epenthetic vowels after monosyllabic roots, such as, precisely, ⟨ki.m-én⟩ ‘know-1SG:IND’ (1895-1897: 38), there are also disyllabic roots that follow this pattern, such as ⟨ja.we.l-én⟩ ‘ride-1SG:IND’ (104).

Just as in nouns with epenthesis, it appears we are dealing with a process that is no longer fully post-lexical, since the epenthetic vowel is sometimes susceptible to stress marking. The interaction with the stem-level stress is crucial to the realisation of stress in such cases. I will return to the issue, however, in the general analysis of the period.

### 3.3.4 Left-edge stress?

For the first time, in the late nineteenth century, we get enough data to examine the issue of an apparent second stress for compounds and verbs. As in contemporary accounts, this stress appears to be realised on the final syllable of the first morphological element (the verbal root or first noun in a compound). However, in verbs we are only explicitly told about this second stress where there is more than one root (i.e. verbs with nominal incorporation or serial verbs) or if there is suffixation beyond the OFI, as in Table 17.<sup>26</sup> The implication, of course, is that minimally inflected forms do not have an independent stress on the stem. In most vowel-final stems this is irrelevant, since stem and word stresses are predicted to be conflated, but in particular in the consonant-final ones, there is room for both stresses. Unfortunately, Augusta gives no exemplification of these cases.

ROOT+OFI	ROOT+OFI	ROOT+SUFFIX+OFI	ROOT+ROOT+OFI
[[e.'lu] <sub>R</sub> -j.-m-i]	[[ko.'n] <sub>R</sub> -i.-m-i]	[[je.] <sub>R</sub> -pa.-'la-j.-m-i]	[[ʃa.'na.] <sub>R</sub> -na.'uɪ-ij]
‘give-IND-2-SG’	‘enter-IND-2-SG’	‘carry-CIS-NEG-IND-2-SG’	‘strike-down-3SG:IND’

Table 17: Stress in minimally inflected verbs, further suffixed verbs, and serial verb constructions

In Lenz’s work, additional stresses in longer verbs are occasionally transcribed. In practically all cases, these stresses are verbal and surface on the root-final syllable (cf. 14).

difficulties for early twentieth century typesetting, as Augusta complains in his introduction to the *Lecturas* (1910: XI).

<sup>26</sup>Augusta tells us that “Verbs with interposed particles [i.e. pre-OFI suffixes] also have two stresses, the primary one being on the verbal root and the secondary, where the given rules require it” (1903: 4)

- (14) a. [[u.'jem.]<sub>R</sub>-tu.-'vi.-ŋe]  
light-REST-3:SP-2SG:IMP  
's/he relight x'  
(Lenz 1895-1897: 84)
- b. [['ki.m]<sub>R</sub>-a.-'vu-j]  
know-FUT-BI-3IND  
's/he will have used to know'  
(Lenz 1895-1897: 32)
- c. [[a.'ʃun.]<sub>R</sub>-.ki.'le-n]  
fatigue-PROG-1SG:IND  
's/he is becoming fatigued'  
(Lenz 1895-1897: 42)

Augusta's *Gramática* states that compounds have their stress where it would be expected for the first root, although it often moves to its final syllable. Indeed, in the examples he provides us with in his *Gramática*, as well as in the transcriptions in his texts (1910), stress is consistently on the final syllable of the first root (cf. 15).

- (15) a. [ku.'ʃe.-pə.ʔi]  
old.lady-soul  
'old woman's ghost'  
(Augusta 1910: 81)
- b. [fo.'θu.-tʃaʔ.wa]  
spine-fish  
'fishbone'  
(Augusta 1903: 4)
- c. [ka.'ʔe.-ka.ʔe]  
shrub-shrub  
'white-flowering plant (*Libertia Ixioides*)'  
(Augusta 1903: 4)

Of course, final stress in the first element of longer words is a feature we find both in the earliest stage of the language and in the contemporary account, presented for PDM as a case of stem-final stress. Clearly, here the definition of *stem* differs from the earliest stages of the language, and even from that at the

immediately preceding attested stage (cf. Section 3.2.3, above). It remains to be seen whether the stem form we find in Lenz and Augusta is compatible with the account given for PDM.

### 3.3.5 Summary

According to Lenz and Augusta, there are two major stress positions for Mapudungun of the period, one on the penultimate mora of the word, and in longer words, another on the final syllable of the leftmost element. There is also some visible alternation in the case of vowel-final disyllables (especially, in Lenz's *Estudios*, for the case of nouns).

Some non-trivial interaction between stress and epenthesis surfaces as well, with Lenz and Augusta showing variability in the stressing of final-syllable, interconsonantal [i]~[ɐ]. In the light of the PDM data, where this vowel receives stress, it seems that Lenz and Augusta's data represent an intermediate stage between a purely post-lexical process of epenthesis (i.e. one that applies after lexical stress), and a vowel-ful underlying representation. Indeed, in Lenz's texts corresponding to PDM northern varieties of Mapudungun (cf. Section 2), we find that stressing the epenthetic is exceptionless, perhaps indicating that here lexicalisation of the process is complete. Tables 18 and 19 give tentative derivations for the three stages in lexicalisation of the epenthetic vowel.<sup>27</sup> Febrés represents the oldest stage, where epenthesis follows stress assignment. Augusta represents the intermediate stage, where nouns are stressed both on the underlying vowel and the epenthetic (the 'spondee' pattern) and verbs vary in the assignment of stress on the (former) epenthetic vowel. Finally, the northern dialects in Lenz represent the most advanced stage, where the vowel appears to be lexicalised, and hence stressed, as it is in PDM.

In the case of the disyllables, there is also some alternation for vowel-final forms, which seems, at this historical stage to be restricted to phrase-final position or to the position preceding the postposition *mo/mew*.<sup>28</sup> In that it is only a tendency, rather than a categorical shift of stress position, and that it refers to phrasal edges and the concatenation of specific words or functional elements, final open syllable stress bears the hallmarks of a phrasal rule.

A key aspect of the verbal stress system, as presented explicitly by Augusta and exemplified often by Lenz, is the interaction of stem and word-level stress. It appears that where the final syllable of the verbal root and mood-marking are not adjacent (i.e. where there are suffixes beyond the OFI), there are two

<sup>27</sup>The cyclical application of rules at a lexical and post-lexical level follows the architecture of Lexical Phonology, as in Kiparsky (1985), where post-lexical simply means that these rules are applied after the word-level rules, in an automatic, phonetic implementation.

<sup>28</sup>For the functions of the postposition see Harmelink (1987).

	Febrés (1765) (North/Center)	Augusta (1903) (Center)	Lenz (1897) (North)
Underlying	/mamʌ/	/mamʌ/	/mamiʌ/
Cycle 1:STRESS	'mamʌ	'mamʌ	ma.'miʌ
EPENTHESIS	—	'ma.miʌ	—
Cycle 2:STRESS	—	'ma.'miʌ	—
EPENTHESIS (post-lexical)	'ma.miʌ	—	—
Surface:	['ma.miʌ]	['ma.'miʌ]	[ma.'miʌ]

Table 18: Differences in stress for disyllabic nouns with interconsonantal [i] ~ [ɛ] ([mamiʌ] ‘wood’)

	18th Century (North/Center)		Augusta (1903) (Center)	Lenz (1897) (North)		
UNDERLYING	/kim-n/	/el-n/	/kim-n/	/el-in/	/kim-in/	/el-in/
STRESS	'kimn	'eln	'kimn	e.'lɪn	ki.'mɪn	e.'lɪn
EPENTHESIS	'ki.mɪn	'e.lɪn	'ki.mɪn	—	—	—
Surface	['ki.mɪn]	['e.lɪn]	['ki.mɪn]	[e.'lɪn]	[ki.'mɪn]	[e.'lɪn]

Table 19: Differences in stress for consonant-final verb roots

stresses, one on the final syllable of the root, and the other on the penultimate mora of the word (cf. Table 17 and example 14).

It is Augusta’s claim that the first element in such constructions — the root, or underived stem — bears main stress, while the rightmost stress is secondary. Transcriptions of stress in Lenz’s texts, however, show this to be somewhat unstable. Here, the majority of verbal forms have only the rightmost, penultimate-mora stress transcribed, while stem-final stress is only occasionally marked.

In other words, although the two stresses are important to the system, their relative prominence appears to be only marginally relevant. As in the contemporary account, we find here that the culminativity of stress does not seem to be strongly enforced for words with complex morphological structure. What does seem important, however, is the marking of the edge of the leftmost constituent, which emphasises demarcation over rhythm and culminativity — a feature we also see in nominal compounds (cf. 15, above). The existence of morphological-boundary-related contours in the stress patterns appears to be more important

than the relative height of the peaks.

Finally, accounting for invariant final stress on adjectives, adverbs and pronouns requires some adjustment to the general penultimate-mora stress-assignment system. Interestingly, this pattern appears to be similar to that of the first stem-element in compounds and verbs. Since I have remained agnostic as to exactly what mechanism brings about stem-final stress, I do the same for these peripheral word categories. I do claim, however, that they must be stressed at the same level as the stems. In a way, the fact that these are all dependent word categories — they do not tend to stand alone, but modify or complement verbs or nouns — may allow us to say that they are not stressed as full prosodic words.<sup>29</sup>

## 4 Preservation and change: from 1606 to the present

As should now become clear, the first three centuries of the historical period for the Mapuche language display a number of striking diachronic processes related to stress. Among these are the system's overall transition from syllabic to moraic trochees, the redefinition of the domain of the stem, the lexicalisation of epenthesis in specific morphological and prosodic contexts, and the development of final-syllable stress in some word-categories. In what follows, I will examine the stages of each one of these changes (Sections 4.1–4.4), evaluate them with regards to the general situation of the language at the time (Section 4.5), and contrast them with what has actually been preserved despite the changes (Section 4.6). More general conclusions regarding the data for the history of Mapudungun morphology and stress interactions follow (Section 5).

### 4.1 Changes in weight sensitivity

The earliest observation we have for Mapudungun (Stage I: Valdivia 1606: 74) claims that stress — in all word categories but verbs — falls on the penultimate syllable. Approximately one hundred and fifty years later (Stage II: Febrés 1765, Havestadt 1777), this pattern appears to be restricted only to vowel-final nouns, while consonant-final ones have shifted their stress to the final syllable. Explicit claims at later stages in the language find this pattern to persist (Stage III: Lenz 1895–1897, Augusta 1903, Stage IV: PDM), although there is a tendency to stress a disyllable's final vowel in certain morpho-syntactic positions (Stages II

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<sup>29</sup>The alternative, as suggested by a reviewer, would be for Mapudungun to be in the process of developing non-cohering foot templates as has been claimed for .

and III) or in particular registers (Stage IV). An overview of these different stages are given in Table 20, with proposed feet in parentheses and key changes in grey.

Stage I	Stage II	Stage III	Stage IV	Gloss
('ru.ka)	('ru.ka)	('ru.ka)~ (ru.'ka)	('ru.ka)~ (ru.'ka)	'house'
('pu.kem)	pu.('kem)	pu.('kem)	pu.('kem)	'winter'
ma.('wi.θa)	ma.('wi.θa)	ma.('wi.θa)	ma.('wi.θa)	'woodland'
a.('tʃa.waʌ)	a.tʃa.('waʌ)	a.tʃa.('waʌ)	a.tʃa.('waʌ)	'hen'

Table 20: Changes in nominal stress in di- and tri-syllables: vowel and consonant final

We assume that the blanket claim for penultimate stress at Stage I applies not only to nouns but to all other non-verbal parts of speech (adjectives, adverbs, pronouns and determiners). By Stage II, the weight-sensitive pattern seems to apply to these word categories as well (cf. Table 21), though we have some initial evidence for stress shifting to the final of two syllables in particular syntactic contexts and registers (see Section 4.4, below). By the turn of the 20th century most disyllabic adjectives, adverbs and pronouns were stress-final, a pattern that continues into PDM (Stage IV).

Stage I	Stage II	Stage III	Stage IV	Gloss
('e.ɲum)	e.('ɲum)	e.('ɲum)	e.('ɲum)	'hot'
('we.θa)	('we.θa)	we.'θa	we.'θa	'bad'

Table 21: Changes in adjectival stress: vowel and consonant-final forms

Table 22 looks at the development of quantity sensitivity in verbs. Stage I data seem to show a fundamentally morphologically-driven stress assignment system, which places stress on the final vowel before the OFI (underlined). However, in the vast majority of the verbal paradigms this position is effectively the vowel of the penultimate syllable (cf. Table 23, below). I suggest, therefore, that where the two are not coextensive (e.g. ['ko.(n-i-m-i)]), there must be, at Stage I, a word-level rule promoting stem stress over the penult. In the tables below the 'demoted' stress is given as a secondary stress mark, although there is no historical or contemporary evidence for these being perceptible for speakers.

Our analysis of Stage II showed verbal stress to follow the same overall pattern of Stage I in terms of stressing the stem-final vowel and the head of a right-aligned trochee, the only differences being that the trochee, as in nouns, was

considered to be weight sensitive and to take priority over stem stress. Effectively, this means that the trochee is more clearly surface-true than in Stage I.

In Stage III, verbs are also stressed on a right-aligned moraic trochee and on the final syllable of the stem. At this point, however, the stem appears to be restricted mostly to the verbal root. Where the two stress rules do not target the same syllable, it is Augusta's contention that the stem takes priority over the root, however, this occurs only where the stem is not immediately adjacent to the OFI (1903: 4).

In the data for Stage VI we find a very similar pattern to that of Stage III, the only major difference being that the stem is defined as the root followed by a limited number of mostly diathesis-changing suffixes (cf. Section 2.2). In this case, the penultimate mora tends to be promoted in the context of clash with the stem-final syllable (which is usually destressed), except when the stem is derived, in which case it takes main stress (see Table 24: d).

Stage I	Stage II	Stage III	Stage IV	Gloss
('ko.n-i-j)	,ko.('n-i-j)	ko.('n-i-j)	,ko.('n-i-j)	'enter-3IND-SG'
'ko.(n-i.-m-i)	,ko.('n-i.-m-i)	ko.('n-i.-m-i)	,ko.('n-i.mi)	'enter-IND-2-SG'
e.('lu.-fi-n)	e.lu.-('fi-n)	e.'lu.-('fi-n)	e.,lu.-('fi-n)	'give-1SG:IND'

Table 22: Changes in right-edge verbal stress

If our data is relatively accurate, the change from syllabic to moraic trochees occurs early in the recorded history of the language, between Stages I and II. For the learner, evidence of final closed syllables being stressed would have most obviously come from the verbal system, in particular from the first person indicative and a number of other forms where the OFI is preceded by a vowel (as in Table 23). Interestingly, in the remainder of the forms of the paradigm there is a very strong tendency for the final syllable to be open and for stress to fall on the penultimate. As a result, the percept would have been that the stem-final stress — which was main stress as well — was usually also on the penultimate mora, thus paving the way for the reanalysis of the footing as moraic trochees.

## 4.2 Changes in the stem domain

Stage I displays an almost purely morphological rule for verb stress: prominence falls on the final vowel of the first person singular indicative — invariably the syllable preceding the OFI — which is then reproduced throughout the paradigm with minimal exceptions (cf. Valdivia 1606: 75 and Table 24). Stage II presents a very similar pattern of stem-final stress, though in competition with penultimate-mora stress. By Stage III, however, we find that primary stress is on the root-final syllable (cf. Table 24: c,d), except in the cases where the root



a. Final Syllable Closed		
[e.'lu-n]	[e.'lu-l-m-n]	[e.'lu-j]
give-1SG:IND	give-SUBJ-2-PL	give-3SG:IND
'I gave'	'if you(many) gave'	's/he gave'
b. Final Syllable Open		
[e.'lu-j.-m-i]	[e.'lu-l-i]	[e.'lu-tʃi]
give-IND-2-SG	give-SUBJ-1SG	give-1SG:IMP
'you(one) give'	'if I gave'	'I shall give!'

Table 23: Stage I stem-stress on a vowel-final verbal stem

is followed exclusively by an OFI, in which case the word-level right-aligned moraic trochee is stressed (cf. Table 24: b). The Stage IV data shows a similar pattern, where roots may be extended to stems by the addition of a very limited set of suffixes (Table 24: d, cf. examples in 3).

	Stage I	Stage II	Stage III	Stage IV	Gloss
a.	e.('lu-j)	e.('lu-j)	e.('lu-j)	e.('lu-j)	give-3SG:IND 's/he gave'
b.	'ko.('n-i.-m-i)	,ko.('n-i.-m-i)	,ko.('n-i.-m-i)	,ko.('n-i.-m-i)	enter-IND-2-SG 'you(one) entered'
c.	e.lu.-('la-j)	e.lu.-('la-j)	e.,lu.-('la-j)	e.,lu.-('la-j)	give-NEG-3SG:IND 's/he did not give'
d.	e.lu.-ɲe.-('la-j)	e.lu.ɲe.-('la-j)	e.'lu.ɲe.-('la-j)	e.lu.'ɲe.-('la-j)	give-PASS-NEG-3SG:IND 's/he was not given'

Table 24: Changes in verbal stem stress

Importantly, by Stage II the purely morphological pattern of stem-final stress has been phonologised to become penultimate-mora stress. This means that stress in Stage II no longer signals the morphological structure of verbs as clearly. Indeed, when penultimate-mora stress and pre-OFI-syllable stress are not conflated, the latter stress is demoted due to immediate adjacency to the main stress (see Table 24: b).

As a result, I argue that the marking of the last pre-OFI syllable soon became redundant (between stages II and III), and additional stress retracted to the next prominent morphological position: the root-final syllable, which is what we find for Stage III (see Table 24: b,c). This change would have had the important functional role of helping to parse longer verbs by signalling the edge of the root. It is unclear whether the suffixes that I have identified as stem-extending in Stage IV were also the locus of stress at Stage III (except for passive [-ɲe], which does

not bear stress). Nevertheless, by PDM the stem domain (or extended-root domain) came to include these suffixes with core root-semantics, which in turn appear to override penultimate-mora stress in clash positions (see Section 2.2 and Table 24: d).

It seems, therefore, that at every stage of the language there are two types of stress at play, one which is fundamentally morphologically driven and the other which is fundamentally phonologically driven. Their interaction is complex and the predominance of one over the other is not always clear. This said, Mapudungun seems to persistently accommodate stress marking to its morphological signalling function.

### 4.3 Lexicalisation of epenthesis

Throughout attested Mapudungun, the locus for epenthesis seems relatively straightforward: breaking up series of onset or coda consonants. Where this happens across morpheme boundaries, the data seem quite robust throughout the four stages, though incipient lexicalisation does seem afoot in the later stages. For morpheme-internal epenthesis, as claimed for nouns, the process does not seem well established at Stage I (cf. 9), where Valdivia seems to tolerate clusters. A century and a half later, though, the old clusters are broken up by the epenthetic vowel [i](~[ə]), which is never stressed at Stage II. Finally, from Stage III onward, there is evidence for erstwhile epenthetic vowels becoming part of the lexical representation, in some contexts. Crucially, this would allow the inserted vowel to be stressed.

Where it occurs at stages I and II, epenthesis seems to be purely post-lexical, since the inserted vowels (given in parentheses in Table 25) are not relevant to the computation of stress.<sup>30</sup> By Stage III, however, both nominal and verbal epenthesis seem to interact with stress in some contexts. Augusta claims, to this effect, that sometimes nominal stress occurs both on a syllable-final epenthetic and on a preceding vowel (the ‘spondee’ pattern of Section 3.3.1), and that verbal epenthetic vowels preceding the suffix [–n] ‘1SG:IND’ are also variably stressed (cf. Section 3.3.3). However, in Lenz’s data for northern dialects it seems that, for both contexts, stress falls on the epenthetic. This latter pattern is also evidenced in the PDM data.

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<sup>30</sup>It may be claimed that this is a cyclical argument: lack of stress signals an epenthetic vowel, which helps signal the pattern of stress. However, the opposite claim — that the vowel is underlying but is reduced and lost due to lack of stress — seems far less likely, since this reduction and loss occurs in cases where we have evidence for early stages with clusters, but not where the vowel is given in the earliest stages. For example, while Augusta’s [pái] ‘soul’ surfaces in Febrés and Augusta as [pi’ái],

	STAGE I	STAGE II	STAGE III (Augusta)	Stage III (Lenz)	STAGE IV	Gloss
a.	['mamʌ]	['mam(ɨ)ʌ]	['ma'miʌ]	[ma'miʌ]	[ma'miʌ]	‘wood’
b.	['pʌi]	[p(ɨ)'ʌi]	[p(ɨ)'ʌi]	[p(ɨ)'ʌi]	[p(ɨ)'ʌi]	‘soul’
c.	['kon-(ɨ)n]	['ko.n-in]	['ko.'n-in]	[ko.'n-in]	[ko.'n-in]	‘I entered’

Table 25: Epenthesis vs. underlying [ɨ] and its relation to stress

One of the major insights we can draw from the nominal epenthesis data is that the tendency to break up word-initial clusters seems much weaker than that to break up word-final clusters. Indeed, the stress data shows epenthesis in word-initial clusters never interacts with stress (see Table 25: b), and is probably an automatic articulatory constraint applying after word-level rules. This contrasts with the state of affairs in final-cluster epenthesis, which eventually becomes part of the representation of the word, taking on stress (as in Table 25: a).

Another interesting conclusion that seems to emerge from the verbal data is that epenthesis is lexicalised more easily when the morpheme it becomes part of underlyingly has more of a fusional structure — as the case of [-in]/[-n] ‘-1SG:IND’ in Table 25: c — that is, when it cannot be decomposed into its constituent parts. This can be contrasted with the epenthetic in [-m-(ɨ)n] ‘3-SG’, which is never stressed, even in PDM. This seems rather common sense, as in the case of portmanteau suffixes there is no necessary correspondence of one morph to one meaning, hence freeing up the suffix from corresponding to the other elements of the paradigm. In other words, portmanteau morphemes appear to more readily develop allomorphy.

#### 4.4 The rise of final-syllable stress

With the exception of some vowel-final nouns as well as the right edge of verbs, PDM shows a clear pattern of final stress. Not only does this apply to adjectives, adverbs and pronouns, but also to the domain of the verb stem, and the first element of compounds. Diachronically, the issue of stress on the final syllable of verb-stems (cf. Table 26: a-b) seems rather uncontroversial, as this is the stated position of main stress — always with some caveats — in the first three stages of the language. Although there has clearly been a shift in the position of this stress, it has never been to the first syllable of the root, except in the case of monosyllables. For compounds (cf. Table 26: c-f) we only have data beginning in Stage III. In Augusta’s work, however, there are only disyllabic stems as first elements, all of which are stressed on the final syllable, regardless of weight. In the Stage IV data there are also trisyllabic stems as first elements. Here the

pattern is different, as it follows that of trisyllables in isolation: final syllables are stressed if closed, otherwise, the penultimate is stressed.

	STAGE I	STAGE II	STAGE III	STAGE IV	Gloss
a.	[ˈko.,n_s-i.-m-u]	[ˌko.,n_s-i.-m-u]	[ˌko.,n_s-i.-m-u]	[ˌko.,n_s-i.-m-u]	‘you two entered’
b.	[u.ˈma,u_s-i.-m-u]	[u.,ma.ˈu_s-i.-m-u]	[u.ˈma,u_s-i.-m-u]	[u.,ma.ˈu_s-i.-m-u]	‘you two slept’
c.			[fa.ˈθu.-,tʃaʌ.wa]	[fa.ˈθu.-,tʃaʌ.wa]	‘spine-fish’
d.			[tʃa.ˈŋiʌ.-na.ˈmin]	[tʃa.ˈŋiʌ.-na.ˈmin]	‘finger-foot’
e.				[ma.ˈwi.θa.-ˈtʃe]	‘woods-person’
f.				[a.tʃa.ˈwaʌ.-,ru.ka]	‘hen-house’

Table 26: Stem-final verb stress and first element stress in nominal compounds

For disyllabic nouns, although word-initial stress would have been the rule at Stage I, by Stage II the switch to moraic trochees left only monosyllables and vowel-final disyllables as stress-initial. In formal speeches, this proportion would have been further reduced by phrase-final disyllables, which would have had final stress regardless of this syllable’s structure. In Stage III, Lenz’s data appears to show the same pattern. Finally, by Stage IV, the alternation has become much more widespread, leaving the cases of disyllables with initial stress as much more of a rarity.

For adjectives, adverbs, determiners and pronouns we have no explicit data for the early stages. In Febrés (1765: 8), the formal speech data never places one of these word categories in phrase-final position, so there is no evidence for stress shifting at Stage II. However, by Stage III the marking of final stress on disyllables within these parts of speech is practically exceptionless (when stress is marked at all). This pattern seems well established in Stage IV as well, where penultimate stress is very rare. In other words, here the final-stress pattern seems to have moved forward more quickly and to have ultimately become more pervasive than in nouns, which still show a fair amount of alternation today (see Table 21).

As a result of the processes outlined in this section, by Stage IV, stems and words appear to dependably be stressed on a first syllable only if they are monosyllabic. The fact that trisyllables in the initial position of compounds are not invariably stress-final, following the moraic trochee pattern (see Table 26: e), points to the issue no longer being just of preference for the final syllable but rather for actively avoiding the initial one. Indeed, I have argued elsewhere (Molineaux 2014: 176–181) that this may be interpreted as an instance initial syllable extrametricality in PDM.

Although the data for final stress in the first element in compounds does not stretch back far enough, it is possible to see the stress-final pattern in verb-stems as far back as we have records of the language. In this sense it is not unlikely

that the pattern of stems (and possibly for the first element in compounds) may have spread to other monomorphemic forms in context. The utterance-final rise in formal speech may have been the first possible context for this spreading, which moved relatively quickly across to all non-verbal disyllables. Such a pattern is likely to have been facilitated by the polysynthetic nature of Mapudungun, whereby the difference between word and morpheme boundaries are less absolute.

## 4.5 The context of change

Adalberto Salas, writing two decades ago, tells us that “the effects of systematic, continuous contact with Spanish are displayed at all levels of today’s Mapuche language” (1992:28-9). Evidently, this includes lexical borrowings at a massive scale, alongside a non-trivial amount of function words, as well as morpho-syntactic adaptations. These include the development of an article system, an increase in analytical formulations (Salas 1992: 29) — including the reduction in frequency of nominal incorporation — and the rise of the agent-verb-object word order (Zúñiga 2006a: 488), to name a few.

Many of the content words relevant to the changes in the Mapuche lifestyle during the conquest (agriculture, sheep-herding, war, and governance) were borrowed early and most likely with little direct contact with Spanish speakers among the general populace. As a result, it is highly doubtful that such words would have been incorporated into Mapudungun following the Spanish stress patterns. It is clear that for segmental patterns, the borrowings of this period tended to transpose the Spanish inventory onto the Mapudungun one, adding no non-native patterns (cf. Hasler & Soto 2012). Although the early grammars give us no evidence for the stress patterns, I assume borrowings would have been adapted to the native system, as is the case, for the most part, even today.

As a result, I assume that the change in the basic foot pattern between Stage I and Stage II cannot simply be attributed to contact conditions, but must be the result of language internal factors such as those suggested in Section 4.1. Even though the moraic-trochee pattern is precisely that of unmarked words in Spanish (cf. Harris 1996), it seems doubtful that these patterns would have kicked off the change, even if they may have helped reinforce it later on.

An interesting possibility is that the preservation of stress-initial disyllabic nouns, as well as the percept of ‘correctness’ for these forms, may be bolstered by Spanish bilingualism at Stage IV. In other words, although we would expect the tendency we see in the peripheral word categories — stressing final vowels in disyllables — to spread to nouns in all syntactic positions, this does not seem to be occurring at the same rate. In the context of practically universal Spanish bilingualism, this is less surprising, as speakers would have abundant data from

new borrowings and from a parallel phonological module in order to assume that the penultimate mora continues to be the correct position for stress, and to apply a postlexical rule to these at the right edge of the phrase.

#### 4.6 Preservation vs. change

Although here I have focused predominantly on reconstructing the major stress-related changes that have taken place in the 400 years of documented Mapudungun, at least as important as these are the elements that have avoided change in the same period. To this effect there are three persistent traits of the prosodic system that must be highlighted: the alignment of stress to the right edge of domains (end-rule right), the left-headed nature of feet, and the use of stress as a strategy for stem-edge demarcation.

Throughout the language's attested history, the right edge of a prosodic domain seems to be the locus of alignment for feet (or syllables, in the cases where I have stipulated morphologically determined stress). This applies both to verbs, and to simplex and complex nouns. Clearly, the question of whether it is the absolute final syllable that is stressed or the head of a right-aligned trochee (syllabic at Stage I, moraic later) is one that causes important noise in the data, especially for disyllabic nouns. However, the global assessment of each one of the different cross-sections obtained for the language shows the general pattern to be one of right-alignment. In this sense, my account differs from the most influential contemporary one: Echeverría & Contreras (1965), which has been taken to show that feet align to the left edge of words.

Another fundamental difference I find with the standard interpretation of Mapudungun stress, as presented in Echeverría & Contreras (1965), relates to the headedness of feet. Throughout the four stages I report on here, it appears that the basic foot-structure of the language is trochaic. The exceptions to this rule are context and register-bound in nouns, and circumscribed to peripheral word categories elsewhere. In verbs, although occasionally the right-aligned trochee may be demoted in favour of stem-stress, a final open syllable is never stressed.

As in the case of end-rule right, the influence of the incoming language presents no conflict, the default stress pattern being clearly trochaic as well (in this case moraic). Furthermore, especially in the case of the spreading of final-vowel stress in disyllabic nouns at Stage IV, it may be the case that widespread bilingualism actually prevents the shift, reinforcing the penultimate mora as the locus of stress.

Another persistent prosodic feature I present here is that of sub-lexical domains aligning stress to the right edge. Although Spanish, the incoming language, does show features of stress following sub-lexical morphological domains

(cf. Roca 2005 for non-verbs and Oltra-Massuet & Arregi 2005 for verbs, among others), this marking does not show the same type of interaction with an independent word-level stress assignment system, as in Mapudungun. In the Amerindian language, stress appears to consistently mark a stem-final syllable (or foot in Stage IV). Where the confluence of penultimate mora stress and stem-final stress (defined as the  $\omega$  minus OFI suffixes) becomes practically exceptionless (at Stage II) the domain of stem stress is re-defined (apparently as the root-morpheme alone) in order not to be conflated with the word-edge stress and to continue to highlight the morphological structure of the word.

The fact that attested Mapudungun has tended to preserve the boundary-marking within complex nouns and verbs, gives further grounding to the contemporary claims for demarcative stress. Ultimately, this feature also reinforces the diachronic pattern by which stress is subordinate to morphological structure, rather than the opposite (cf. Molineaux 2014).

## 5 Polysynthesis and domain pertinacity

This paper has examined the known evidence for the phonological system of Mapudungun up to the early twentieth century, and ventured a plausible set of rules for stress assignment at four distinct stages. It is, of course, difficult to ascertain whether the differences between the sets of data are an artefact of the methods for data-gathering and the perception of the researchers involved, or whether they are actual historical differences. Unless there are contradictions in the data from the same period, I have taken the grammarians' reports at face value.

Considering the historical data, as well as the sources for PDM, I assessed the commonalities and differences between the four outlined stages, attempting a diachronic view of the relation of stress and morphological structure.

The major changes identified in the language occur early in the recorded history, when relations between Spaniards and the Mapuche were less fluid, and are therefore unlikely to be contact-induced. Two of these changes were the development of weight-sensitivity and the re-definition of the domain of the stem. Both of these processes appear to be related to the disambiguation of the partial conflation of stem- and word-level stress assignment. The third change — lexicalisation and stressing of epenthetic vowels — seems slightly later, as it is first attested at Stage III. Here, the process seems to be most robust where the morphological structure of the words is less transparent.

Finally, the shift of stress from the first to the second syllable of vowel-final disyllables in non-verbs appears to be a phrase-final phenomenon, and is attested starting at Stage II. By Stage IV, however, the pattern seems to have be-

come predominant in words in phrase-internal contexts. Here, I have suggested that Spanish foot structure may well have contributed to the preservation of the stress-initial pattern in nouns.

The demarcative function of stress in Mapudungun, and its pertinacity across the four stages of the language, is one of the more interesting findings in both the synchronic and diachronic data. If we, furthermore, take into account the polysynthetic nature of the language, the motivations for this type of phenomenon become more transparent. If the ideal polysynthetic language has single words as full sentences — as is no doubt possible for Mapudungun —, word-stress may have more features of the phrasal type and less of the word-type. As a result, it seems that Mapudungun places a greater value on demarcation (which is typically a phenomenon related to the phrasal level), than on culminativity (typically prosodic-word internal).

The issue of lack of clear culminativity is present in the PDM literature overall, where we find alternation between the different grammars as regards the preponderance of stem vs. word level stress. This is perhaps clearest in Smeets's claim that there may be two main stresses in longer words (Smeets 2008: 64). The fact that the data at Stage IV finds the same lack of clear culminativity at the morphosyntactic word level, points to a deep-seated tendency — most likely related to the language's morphological type — for sacrificing culminativity and rhythmic structure in order to highlight the morphological structure of words. From a diachronic perspective, this is particularly interesting since Sala's claim that "a high degree of resistance to change may be seen as an overall, prominent feature of the Mapuche language" (1991: 166). While this seems to hold for segmental and morphological change, prosodic structures seems ever-ready to change in patterns that preserve and highlight morphological structure.

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